Towards an understanding of the strategic use of mobile ICT in small and medium enterprises

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Abstract

Mobile information and communication technology (ICT) has the capability to strategically influence and completely transform SMEs. It provides heterogeneous benefits in information sharing, collaboration and corporate interactions. However, mobile resources do not improve competitive performance on their own. Instead, purposeful or tacit strategic actions are required to combine existing resources in innovative ways, to acquire additional valuable resources or to dispose of redundant resources. Companies have to accomplish this quickly and repeatedly if they are to remain competitive. This research project employs the strategic management theory of dynamic capabilities (DCs) in a qualitative case study to analyse the transformational capacity of mobile ICT in each SME from a strategic perspective. Candidates from ten SMEs were interviewed. The data was analysed to identify: a) the DCs that are essential for mobile transformation in SMEs, and b) the practices that develop and maintain the effectiveness of these capabilities. Eight distinct mobile DCs are identified, each contributing to firm performance, profitability or strategic advantage over competitors. The results were consistent with previous research in DCs by confirming a maximised effectiveness of capabilities when they are tautly coupled with business strategy. The dissertation concludes with valuable guidelines and a conceptual framework for SMEs to strategically utilise mobile ICT and achieve mobile transformation.

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***Keywords*:** Mobile information and communication technologies | mobile business | dynamic capabilities | mobile strategy | mobility.

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Chapter 1 – Background and motivation

1.1 Introduction

Mobile information and communication technology (ICT) has the capability to completely transform businesses, products, processes and industries (Basole 2005b). Mobile ICT, which includes devices and wireless networks capable of supporting computing power on the move, has initiated the next information technology (IT) renaissance (Basole 2007; Sheng, Nah & Siau 2005). It includes "technological infrastructure for connectivity, such as Wireless Application Protocol (WAP), Bluetooth, 3G, and General Packet Radio Service (GPRS), as well as mobile information appliances such as mobile phones, PDA [tablets], and laptop computers" (Sheng et al. 2005:269-270). There are well-established reasons why mobile ICT is attractive to small businesses. It makes information access available 'anytime, anywhere', provides improved collaboration and communication, as well as forming new bonds for information sharing (Basole 2004; Sorensen 2004).

Mobility is high on the list of concerns for small and medium enterprises (SMEs). A survey of 400 small businesses (Dunn 2005) revealed that:

- the managers spend 27% of their time outside the office,
- 32% of the owners considered their laptops as essential to the accomplishment of their work and to help them remain competitive with the larger organisations, and
- 36% of the owners said that the acquisition of more laptops will be their top priority spending in the next fiscal year (Dunn 2005).

Many organisations have enjoyed the benefits of providing employees with mobile e-mail, or mobile calendars and they are looking at additional ways of improving their employee mobility by exploring more complex applications. The potential benefits of creating a mobile business include boosted productivity, efficiency, client relations, employee satisfaction and reduced mobile security costs (BlackBerry 2010). However, "the key to successful business mobility is careful mobility planning" (BlackBerry 2010:4).

The strategic value of mobile ICT and its potential impact on business competitiveness makes it an interesting topic to research. A comprehensive mobility strategy is critical for SMEs. It will manage security concerns, evade incompatible technologies, carefully allocate scarce financial resources, and it will stabilise the influence on people, technologies and processes. It will also enable the small business to carefully take advantage of the technological evolutions in mobile technologies (Passerini, Patten & Bartolacci 2007). The theory of dynamic capabilities (DCs) is a strategic theory that can be either exercised to plan for mobility or used as an analysis theory to understand the strategic actions implemented by corporate entities. This study employed the theory in an analysis

capacity to understand the strategic action exercised by SMEs from different industries in their strategic utilisation of mobile ICT.

The purpose of this study is to understand the strategic usage of mobile ICT in SMEs, from both a purposeful and tacit strategic perspective. It also aims to assist SME managers in undertaking the task of mobile strategic planning to achieve a mobile transformation. The term mobile transformation refers to the organisation's prudent deployment of mobile ICT to significantly modify its business strategy, strategic processes and operating procedures and organisational interfaces. Strategy is defined as a "pattern in a stream of decisions" (Mintzberg 1978:935). Accordingly, this study applies the theory of DCs to identify the patterns of decision making and to categorise them according to specific capabilities that are required for mobile transformation in SMEs. Secondly, the study identifies the practices necessary in developing the DCs that are both effective and shared across industries, and accordingly, can be referred to as being 'best practice'. The dissertation concludes with guidelines for SMEs for the deployment of mobile ICT so that they can achieve mobile transformation. The guidelines are illustrated in a conceptual framework. This study utilises an exploratory research approach to contribute to and inform future empirical examinations of mobility strategy and transformation in SMEs.

1.2 Problem statement

Some researchers believe that mobile ICT is a strategic resource and that it is capable of activating strategic advantage and improving overall business performance (Coursaris, Hassanein & Head 2008; Brown 2004). It is, however, a commodity and, therefore, it is not the technology that can offer any advantage, but rather its strategic application in the enterprise. The domain of mobile business is characterised by swift fluctuation and in such markets, firms cannot place their confidence in resources alone to provide a competitive advantage. Instead, they are required to strategically combine existing resources in innovative ways, to acquire additional valuable resources, and dispose of redundant resources. They have to accomplish this quickly and repeatedly if they are to remain competitive (Daniel & Wilson 2003). However, regardless of the challenges that SMEs face, the adoption of IT is recognised to be critical for the SMEs' competitiveness in this local and global market. Most of the research on IT adoption among SMEs has found that investment decisions are driven by operational, cost and efficiency concerns (Dyerson, Harindranath & Barnes 2009). SMEs do not generally indulge in formal strategic planning, because they are generally more focused on operational survival or on 'fighting fires'. They also often lack the time or financial resources to conduct sufficiently intricate planning (Dyerson et al. 2009; Ghobakhloo et al. 2012). Their mobile investment decisions are often based on tacit decision making. However,

mobile computing and other cloud technologies are now, more than ever, available to the SME at affordable prices (Passerini et al. 2007). This means mobile technology is now within the grasp of innovative SMEs. “For these firms it has become a strategic opportunity to be seized” (Blili & Raymond 1993:448). SMEs are uniquely positioned to take advantage of this opportunity if they can apply the necessary strategic insight (Passerini et al. 2007). This study’s objective is to provide guidelines to SMEs to enable them to employ mobile ICT strategically.

Strategic planning concerning information technology is not a popular agenda with SMEs (Gottschalk 1999). In fact, many organisations, and not just SMEs, view planning as an unnecessary indulgence. Regardless of this, when it comes to making large, risky investments in information systems, considering the demands of the ever-developing technology, it requires planning (Ward & Griffiths 1998). This is also true for the volatile and quick-evolving mobile technologies. Organisations will never realise the potential of strategic planning if they fail to engage in it (Clemons & Weber 1990; Lederer & Sethi 2012; Salmela et al. 2000). Unsubstantial strategic planning is often the cause of incomplete information system (IS) projects, resulting in incompatibility, redundancy and inflexibility in IS architecture. This process, although time consuming, will assist SMEs with effective IS/IT investment management and scarce resource allocation (Lee & Pai 2003), both of which are integral to the livelihood and health of an SME.

Current literature addresses the problem of IS/IT strategy in SMEs from the theoretical perspective of DCs (Bullon 2009; Caldeira & Ward 2003; Chen et al. 2008; Daniel & Wilson 2003; Duhan et al. 2010; Eze et al. 2013; Katkalo et al. 2010; Liang et al. 2010; Raymond & Bergeron 2008; Trainor et al. 2011; Wu & Hisa 2008). However, there is not enough information available regarding the process of strategically utilising *mobile ICT* in SMEs according to the theoretical reflection of DCs. Furthermore, despite the importance of the topic, or the empirical academic research already completed, there still remains a disconnect between strategy research and practice. This poses a problem for practitioners and academic researchers alike (Teubner 2007).

This research study investigates the strategic intent of how mobile ICT is used by different SMEs. The theory of DCs is used to analyse the use of mobile ICT in each SME from a strategic perspective. The theory will pinpoint the strategic use of mobility even when its origin was tacit in nature. This dissertation aims to recognise the DCs that are essential for mobile transformation in SMEs and to identify the practices that develop and maintain the perceived effectiveness of these capabilities. The practices are also compared between firms to identify commonalities and to evaluate whether they can be considered as ‘best practice’.

1.3 Background

Mobile ICT should be incorporated in an organisation's IT strategy. As mobile technology ever-increasingly diffuses into organisational work structures, its prominence in the IT strategy will also increase. This study will focus only on the section of the overall IT strategy that is dedicated to mobile ICT.

Strategic planning for mobile ICT has made a significant comeback to be frequently featured in IS magazines (Kontzer 2012; Nunziata 2010; Teubner 2007). Research in mobility has expanded rapidly and still increases by more than double each year (Scornavacca et al. 2006).

> *"The relationship between information technology and corporate strategy is another area that could be explored further using a structured program of multiple case studies. From the case studies conducted to date, there is evidence that some companies use information technology more effectively as a strategic weapon than others" (Benbasat et al. 1987:382)*.

The IT adoption requirements of SMEs differ from those necessitated in larger organisations (Ghobakhloo et al. 2012). Thus, a different adoption strategy is required than the formal and rational planning methods of larger organisations. However, since many SMEs do not partake in formal strategising, it will be necessary to look deeper into how they currently use mobility in their business processes. This necessitates an attempt to discover the emerging pattern of the SMEs operational goals, their processes and policies, to discover what their true mobility strategy is (Quinn et al. 1988).

1.4 Definitions

The terms mobility and strategy are explored in this section.

"Mobility is the ability to access your office information and data remotely and to conduct business anywhere, anytime. Mobility solutions provide mobile and remote access to your company data and e-mail" (LammTech 2008:1). The term mobility does not refer to any specific physical device, but rather encapsulates the function and the conduct of being mobile through the enablement of mobile ICT. The terms 'mobile' and 'mobility' can be defined as follows:

Mobility – noun: "Refers to the ability for achieving mobility through the enablement of mobile technologies" (Basole 2004:[2]). "The application of mobile devices and wireless technology to enable communication, information access, and business transactions from any device, from anyone, anywhere, at any time" (Kornak et al. 2004:4). "This definition includes everything we can do using a mobile phone or a wireless link connected to a computer network regardless of the technological

platform used" (Fouskas et al. 2005:353). And, as used in this dissertation: mobility has significance to the medium as an IS rather than its connotations to specific technologies. Consequently, merely referring to mobile ICT would not suffice.

Mobility – adjective: assigns the function of being mobile to the noun.

Mobile – "refers to the state where an entity – whether physical, non-physical, tangible or intangible – can move or be moved" (Basole 2004:[2]).

Strategy – "Strategies exist at different levels within the firm, at the corporate, business and the functional level" (Madan et al. 2003:[4]). It is defined as a "pattern in a stream of decisions" (Mintzberg 1978:935). In this dissertation, the word 'strategy' largely alludes to functional strategies such as the IT strategy (or mobile strategy), unless otherwise specified.

1.5 Main research questions

The main research question of this study is: How do DCs enable the strategic utilisation of mobile ICT in SMEs to effectively contribute to a complete mobile transformation?

The sub-questions that this dissertation will attempt to answer are:

- How do DCs enable sustained success in the turbulent environment of mobility?
- Are there standard established practices that can develop and maintain these capabilities?
- Why is it significant that such practices can be commonly shared across different companies?

1.6 Research objectives

The main objectives of this study are:

- To investigate and understand how SMEs utilise mobile ICT in a strategic capacity from the theoretical perspective of DCs.
- To investigate and understand how mobile ICT develops, enables and maintains DCs that will allow SMEs to achieve mobile transformation.
- To identify how DCs enable sustained success in the turbulent environment of mobility.
- To identify what practices are both effective and standard across different companies for the development and maintenance of the DCs.

- To analyse the significance of the practices that are standard across different companies.
- To recommend guidelines to SMEs for the deployment of mobile ICT so that they can achieve mobile transformation.

1.7 Dissertation statement

The statement in the dissertation informs the reader exactly what this study is investigating (Hofstee 2006). The problem, as identified before, is that there is not enough information available about the process of strategically utilising mobile ICT in SMEs from the theoretical perspective of DCs. If SMEs decide to conduct sufficient strategic planning, then they would be able to develop strategic approaches to mobility that can completely transform the business in terms of the business strategy, processes and organisational interactions. This study proposes to assist SMEs in the development of such strategic approaches to mobility. Accordingly, it culminates in guidelines that direct SMEs as to how to correctly approach mobility from a strategic perspective. A conceptual framework illustrates these guidelines.

Formal and analytical approaches to strategic planning are not sufficient for the requirements of SMEs, which often lack human and financial resources. In addition, SMEs often operate more informally and they are inherently and historically dependent on tacit strategic creation (Daniel & Wilson 2003; Hussin et al. 2002). Consequently, this dissertation proposes that the strategic theory of DCs is a viable alternative to the formal and analytical approaches to strategic planning (Daniel & Wilson 2003; Teece et al. 2007). The theory of DCs is more robust to cope with the turbulent environments of SMEs. It also believes that the threat to companies do not originate from competitors, but rather internally from its own inability to capitalise the development and sustainment of effective DCs (Eisenhardt & Martin 2000). Therefore, this study set out to analyse how mobility is currently being used in highly successful SMEs. It also identified SMEs that have experienced a mobile transformation. The theory of DC was used in an analysis capacity to identify mobile DCs that are currently being used in a strategic capacity by SMEs, either purposefully or tacitly. The study accordingly suggests that prospective SMEs should be guided by the success those mobile DCs have achieved in the companies studied.

The study also identified effective practices that frequently occurred in the interviews. These practices develop and maintain the effectiveness of the DCs. Therefore, these practices are also included in the guidelines and the conceptual framework to direct future SMEs.

Finally, it was necessary to provide evidence that the SMEs that were interviewed, have truly achieved success in mobile transformation. To empirically prove this

concept is not possible in the scope of this study. It is necessary to further develop this concept in future research. However, for the purposes of this research, the researcher proposes the subjective interpretation of the transformation achieved in the selected companies. The candidates interviewed were asked to describe different dimensions of mobility's influence on their company. Their answers and the researcher's own analysis of each interview, as it compares to the complete body of interviews, were used to develop a subjective description of the mobile transformation in each company.

Since SMEs find it a challenge to conduct strategic planning in mobility, it is expected that this research project can contribute towards pragmatic approaches that can guide SMEs through this process.

1.8 Delineation and limitations

It falls outside the scope of this study to provide an empirical and repeatable research approach for investigating mobile transformation in SMEs. Empirical research into the subject demands the attention of a study on its own. Consequently, the conclusions regarding mobile transformation in the SMEs interviewed were subjectively developed according to the processes previously described. The conclusions regarding transformation are also described in greater detail in section *5.3.3 Mobile transformation observed in the interviews*.

The results of this study are slightly limited because only one participant per SME was interviewed. This was an unfortunate, but unavoidable limitation due to time constraints.

1.9 Underlying assumptions

Previous research conducted in the strategic management field of DCs has empirically proved that DCs contribute towards competitive advantage. These results were assumed to be true for all types of businesses, including SMEs. Other researchers also conducted extensive research into the DCs of IT/IS and various conclusions about their contributions towards competitive advantage and company profitability have been suggested. Since mobile ICT describes a portion of information technologies, it was assumed that the results that were relevant to IT as a whole would also be relevant to mobile ICT.

1.10 Significance of this study

This dissertation provides an alternative source of strategic guidance than what is offered by the analytical, conventional strategic frameworks. The theory of DCs has incited considerable interest in the field of strategic management. It is an insightful discipline that could certainly provide valuable and pragmatic implications for practitioners (Daniel & Wilson 2003). This study utilises an exploratory research approach to contribute to and inform future empirical examinations of mobility strategy and transformation in SMEs. It can also contribute towards a growing body of knowledge of DC research.

1.11 Chapter outline

Chapter 1 – Background and motivation

This chapter provides an introduction to the research, information about the problem, and explains the significance and the contribution of this study.

Chapter 2 – Literature review

The research statement and the research questions were used to direct the study of the current literature in the field of mobile ICT, SMEs and in strategy. Certain themes and topics were identified from the research questions and these guided the review of existing literature.

Chapter 3 – Theoretical underpinning: dynamic capabilities

This chapter discusses the theoretical underpinning. In this study, the theory guided the collection of field data. However, the interview questions still left a considerable degree of openness so that the research would not be stifled through a too rigid application of the theory. The theory was also central in guiding the process of analysis. The underpinning theory is the theory of DCs.

Chapter 4 – Research methodology

This chapter describes the research assumptions, the research methods, the data gathering techniques and the data analysis techniques used. It also provides information regarding the research participants and the data collection instruments used.

Chapter 5 – Data analysis and findings

In this chapter, all the data collected from the interviews is discussed and analysed to present the research findings. Detailed background information regarding the SMEs interviewed is provided.

Chapter 6 – Discussion of results

Chapter 6 delves deeper into the mechanics of how the underpinning theory was used to realise the results. It provides evidence for the results, identified according to the conditions required by the theory. The chapter develops guidelines that will direct SMEs in strategically implementing mobile ICT. A conceptual framework that illustrates the guidelines is introduced and discussed.

Chapter 7 – Research summary and conclusion

All the findings of this study is summarised and answers are provided for the research questions. It provides a description for the research contribution, a discussion of limitations and it indicates recommendations for future research.

References

A list of all the referenced material referred to in the dissertation.

Annexures

Contains copies of all the additional material used for this study.

1.12 Concluding summary

Chapter 1 draws attention to the gap in the current literature regarding a strategic approach to utilising mobile ICT in SMEs. The chapter introduced the concept that will be studied. It describes the challenges faced by SMEs and provides a guideline as to how the researcher will approach the solving of the problems and questions. It also provides a short description of the expected results. The following chapter, chapter 2, discusses previous relevant literature and recommendations made by previous authors. It describes the main focus areas and identifies relevant themes evident in the literature.

Chapter 2 – Literature review

2.1 Introduction

The previous chapter provided information about the research problem and proposed a method for addressing it. It introduced the topic, provided background information to enhance the content and define unfamiliar terms. This chapter, chapter 2, discusses current literature findings according to related and relevant themes. The chapter focuses on knowledge and empirical findings that can contribute to the research conducted in the study. It also provides a conceptual and contextual understanding of the topic.

2.2 Business value of mobile ICT

It is important for SMEs to enable their employees to be productive in and out of the office. To attain this goal SMEs can improve the efficacy of their employees by providing them with mobile access to necessary services (LammTech 2008). Mobile ICTs can improve the activities throughout a business' value chain with efficiency, convenience and effectiveness gains - which can have a transformational effect on the entire business, thereby cultivating a competitive advantage (Barnes 2002; Basole 2004; Porter & Millar 1985). In this way, mobile technology can provide the business with a variety of benefits, such as connectivity, collaboration, productivity, interactivity, litheness and location based services (Barnes 2002). The most advertised, or hyped advantage of mobility is that it can provide anytime, anywhere computing (Varshney & Vetter 2000; Sheng et al. 2005). This is intended to enable geographical and temporal independence in work practices (Basole 2004). The value of this is significant since an investigation by the Yankee Group Study (LammTech 2008) discovered that more than fifty million employees in the US are mobile and they spend a minimum of 20% of their time at locations different to their primary workspace. Consequently, the strategic value of mobile ICT can be summarised into three main suggestions: enhancement of work processes; better quality collaboration and knowledge distribution and improved marketing and sales efficiency (Sheng et al. 2005).

While mobile ICT development advances at a rapid pace, many businesses are still lagging in the deployment of these value-added services (Fouskas et al. 2005; BlackBerry 2010). Currently, email and calendar applications dominate mobile usage, but there are many more applications that are quickly catching on, as illustrated in Figure 1 (Schadler 2011). But, mobility should not be satisfied with these minor successes. There is so much more on offer. Many companies are deploying business applications that will further improve productivity. Applications such as Enterprise Resource Planning (ERP), Customer Relationship Management

(CRM) and other sales force applications are currently being mobilised to great success (BlackBerry 2010).

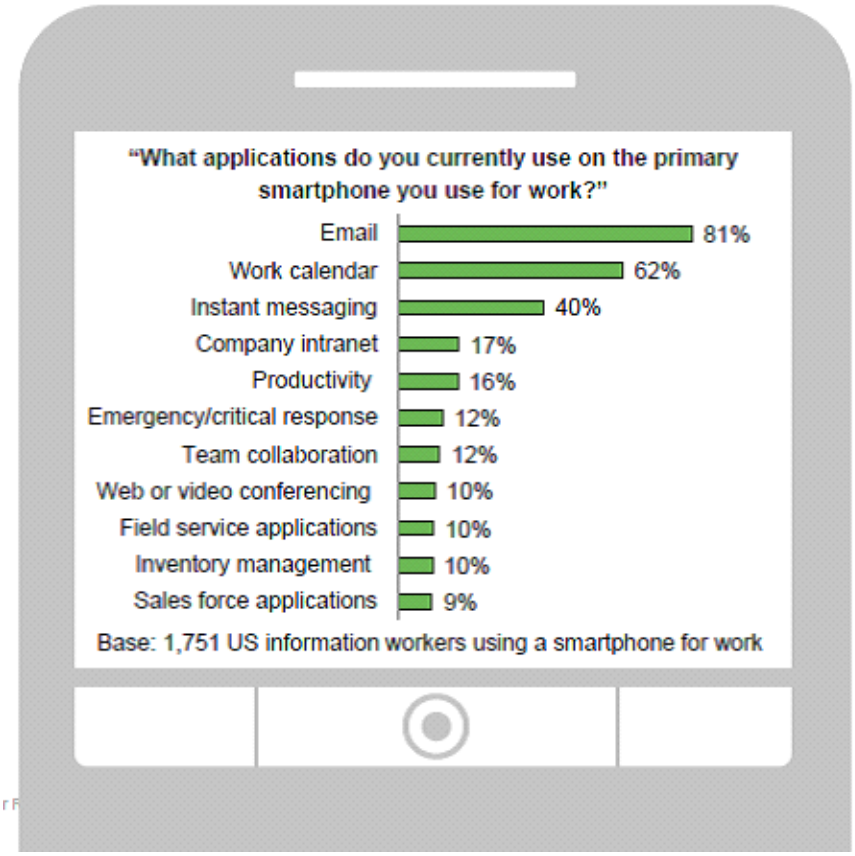

Figure 1: Applications currently used on the smartphone (Schadler 2011:11)

A big challenge for CIOs, or small business owner-managers, is the new trend of bring-your-own device (BYOD). It allows employees the freedom to choose their own devices and service packages. The employee is then personally responsible for security and other updates on his device (Kontzer 2012). It goes without saying that this poses major security risks (Forrester Research 2009). However, to its benefit, it is expected that employees will take better care of their own personal devices and it would be a big area of cost saving particularly important for small businesses (Tucci 2011b). In fact, one rehabilitation company has achieved great benefits in letting employees take care of their own devices. This freed up the IT department to take on more strategic projects (Tucci 2011c). Of course, it is a major challenge for CIOs to adapt their business models and policies to accommodate BYOD, but the trend is quickly catching on with 48% out of 1 751 workers in the United States participating in this movement (Schadler 2011). If the risks are carefully considered in a mobility strategy, then this service could be a solution to some of the SMEs' resource restrictions. In order to take advantage of an opportunity like this it will, however, be essential for the development of a mobile strategy that can plan for the complexities of this service (Tucci 2011c).

Organisations are also currently building mobile applications for their employees, customers and suppliers, as depicted in Figure 2 (Schadler 2011). As more employees spend time on the road, the productivity applications are creating more powerful mobile devices that enable employees to stay productive regardless of location (BlackBerry 2010).

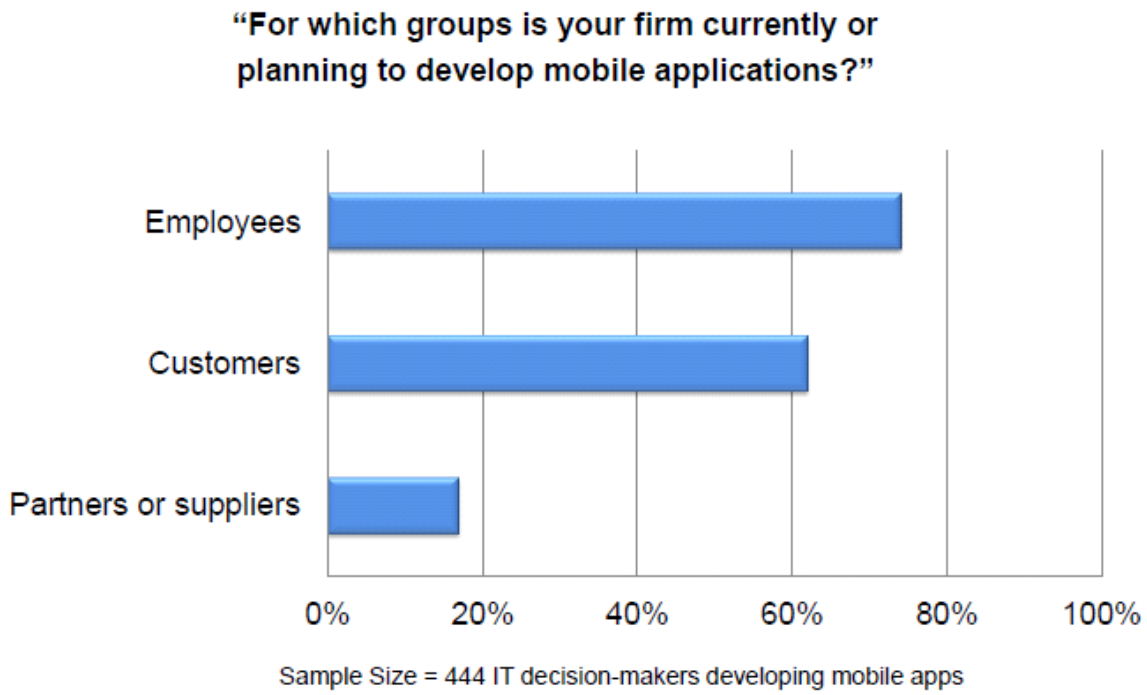

Figure 2: "Organisations are tackling mobile apps for everyone" (Schadler 2011:13)

Mobility is on the increase and it is not going to slow down. An excess of 80% of companies listed in the Fortune 100 have already deployed or are experimenting with tablet PCs. Already business executives love to flash the device on planes and on trains (Tucci 2011a). Figure 3 shows the mobility forecast expected during the next five years. SMEs will need to plan and prepare for this, or, to their deficit, they will be left behind.

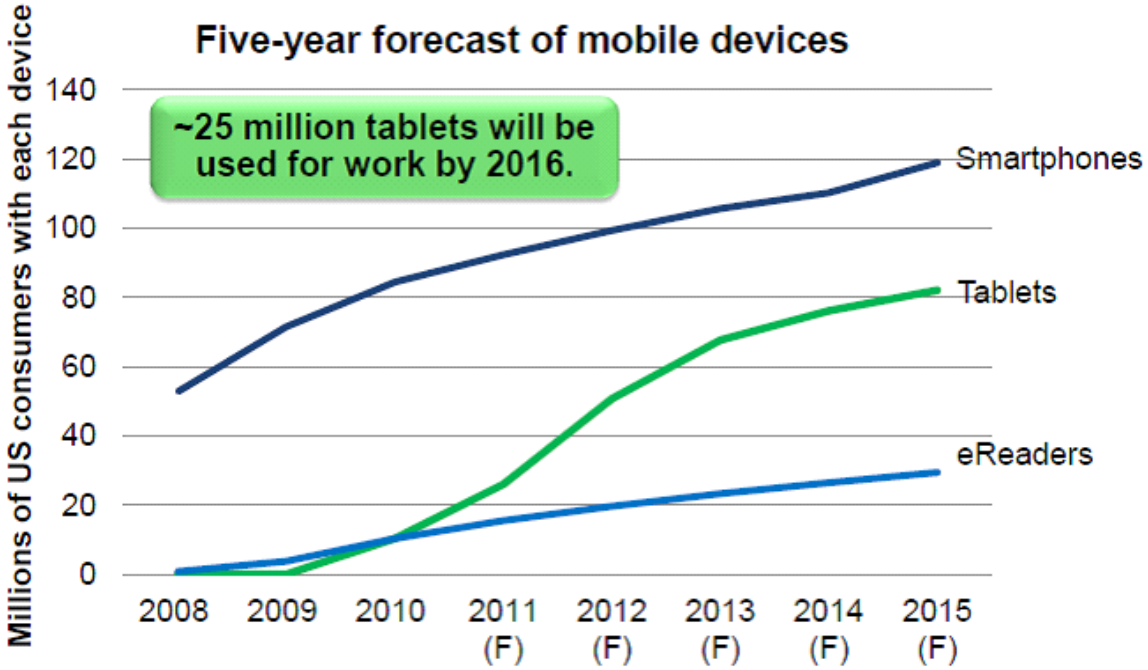

Figure 3: Forecast for smartphones and tablets (Schadler 2011:14)

The engagement with customers, employees and suppliers will become more strategic, as companies branch out with mobile applications (Schadler 2011). Generating a favourable return on the mobility investment will be a significant challenge, but there is a lucrative strategic advantage available for the business who can integrate and assimilate mobile work procedures in the best way (Basole 2007). Mobile technology is of vital strategic importance. The rapid development of the technology has created many new opportunities for innovative ways of applying mobile devices and services (Sheng et al. 2005).

There are companies that have attained coveted, successful achievements with mobile ICT and they have proven that quality collaboration will improve business performance (Frost & Sullivan 2007). Information workers can embrace the freedom to work from any location and to have all the necessary information and business access portals (Schadler 2011). CIOs will be pressured by employees who want to use their personal mobile devices in the office. Many employees will invent sneaky reasons why their mobile devices are essential to their work, but truthfully, they just want permission to go out and buy an alluring new device (Tucci 2011c). However, it will not only be the employees who are pressuring the CIOs or IT managers, the CEOs will also push the IT departments to trim the budget yet still deploy some of the new buzz word technologies, such as: on-demand services, cloud computing, instant-access, mobile readiness and cost transparency (Schadler 2011). It is both the push of technological innovation and the pull of employees in favour of mobile adoption which will ensure the increasing importance of mobile ICT.

Probably the most achievable and pragmatic method in which mobility could benefit a small business, is for salesmen to show up to client meetings with a tablet and a

wireless projector rather than a role of papers. That is bound to make a good impression on the client and to open further prospects for the business (Kontzer 2012). The tablet is quicker on start-up than a laptop, and the 3G capabilities allow salesmen to close deals instantaneously. With the constant mobile connectivity, salesmen are also able to deliver the most up-to-date information or prices to their clients and they are easily able to make last minute changes to their presentations. Mobility can be a significant benefit to a small business in many other methods as well:

- It will improve communication and collaboration and thereby enable the business to run more productively and effectively. If an SME would enable their employees to have access to necessary information remotely, it would improve overall productivity and consequently, this could lead to achieving competitive advantage. Remote access to information would mean that time spent on the road or out of the office will not be squandered (LammTech 2008).

- Mobile access to customer queries would improve response time and lead to greater customer satisfaction. Having satisfied customers would distinguish a business from its competitors (LammTech 2008).

- Mobile computing capabilities would empower employees to work from home or from any other convenient location. Flexible work environments will lead to more content employees (LammTech 2008).

Basole (2007) presented a table which lists the enterprise benefits of mobility. Table 1 below shows the same benefit types as used by Basole (2007) but the details of the benefits have been supplemented and enhanced to also include the research of other authors:

Table 1: Types of mobile benefits (Maree, 2011) (Unpublished)

Types of benefits (Basole 2007)	Details
Strategic Benefits	Greater customer satisfaction; enterprise visibility into assets and resources; higher return on investment; enterprise process visibility (Basole 2007; Frost & Sullivan Whitepaper 2007; Zetie 2005).
Informational Benefits	Rapid decision making due to the accessibility of information and resources; immediate access to required information (Basole 2007; Sorensen 2004).
Transactional Benefits	Cost reduction (specifically in communication); improved productivity regardless of location; improved time management; trusted accuracy; real-time data transmission (Basole 2005; Frost & Sullivan Whitepaper 2007; Sorensen 2004).
Enterprise Transformation	The fading of organisational boundaries; healthier teamwork; corporate control; a horizontal organisational culture (Basole 2005; Frost & Sullivan Whitepaper 2007;

	Sorensen 2004).
Business Value of ICT	Mobile ICT efficacy, effectiveness and convenience in the enterprises (Basole 2004; Basole 2005).

2.3 What is mobility?

In this study, mobility is referred to as the advancement of mobile technology and mobile wireless computing, including business improvements in communication, coordination and collaboration (Scornavacca & Barnes 2008). Mobile ICT is advancing and improving daily and it is difficult to remain up to date with the latest devices. The movement for miniaturisation of useful and popular devices is a significant driving force for the technological advancement of mobile devices. This results in more complex and capable computing capacities in smaller-and-smaller devices (Hart & Hannan 2004). Mobile ICT should be considered as a complete network of systems which includes the mobile users, their devices, the wireless network and its hardware, the interface and interaction medium and also the mobile applications (Varshney 1999). This concept was expanded by researchers to also include the pervasive element of mobility which creates an 'always on' mobile environment (Kishore & Mclean 2002). Pervasive computing comprises of smart devices which are fitted with micro processing technology and are able to connect to intelligent networks to access information and services directly and securely (IBM 2006 in Passerini et al. 2007). The popular explosion of mobile and wireless communication technologies such as third and fourth generation mobile networks, Radio Frequency Identification (RFID) and wireless local area networking has opened the gates to the advancement and commercialisation of a myriad of applications and services. Many of the advancements were made possible by the emergence and integration of mobile technology with the web and consequently we have witnessed an unprecedented widespread adoption of mobile ICT (Fouskas et al. 2005).

In essence mobility involves the following:

- Distributed applications and services – Such applications and services are not localised to the desktop computer anymore. Instead the applications and services can be connected to a mobile or wireless network and then they can be accessed through mobile technologies (Fouskas et al. 2005). The main objective of the applications and services are to maximise the benefits to the company with the fundamental purpose to - "maximize customer service, maximize company image, maximize employee satisfaction, maximize efficiency, maximize effectiveness, and minimize cost" (Sheng et al. 2005:277).

- Location identification – This is a particularly beneficial attribute of mobility and it provides the opportunity for applications and services to use the user's geographical position in an attempt to provide a value-added service (Fouskas et al. 2005).

- Personalisation – Device, application and service personalisation has become possible due to the nature in which the user is uniquely related to his device thanks to the distinct SIM card identification or the unique IP address attributed through the mobile network (Fouskas et al. 2005).

- Anywhere, anytime – Mobility will eventually accomplish the task of making information available anywhere, anytime. Although full ubiquity is still very far from being achieved, significant strides have been achieved making computational resources more available (Dholakia & Zwick 2004; Basole 2004). The final aim of mobility is to achieve complete pervasiveness and to be perceived by people as being a part of the natural world (Fouskas et al. 2005).

The increased storage capacity and decreased cost of mobile devices has made mobile phones into a popular commodity to most users. The development in this mobile computing arena has created new business and marketing opportunities for applications and services which can be defined as mobile-business (mBusiness) or mobile-commerce (mCommerce) (Fouskas et al. 2005). The correct term depends on the particular transaction involved (Varshney et al. 2000).

2.3.1 The mobile enterprise

The mobile enterprise refers to a firm which has been fundamentally transformed through mobility regarding the geographical independence of its employees, mobilisation of all its processes and the mobilisation of all its interactions with the market (Scornavacca & Barnes 2008). A mobile enterprise is not simply deploying laptops to enable employees to work from home. Experts have determined that laptops provide such little true mobility that it is rather identified as a geographic extension of the existing static enterprise. Similarly, an enterprise does not become mobile by simply handing out smart phones, tablet PCs and other handheld devices (Basole & Rouse 2007). A mobile enterprise "is defined by the degree to which an organisation's operations and information needs, typically employee activity, are supported in a 'geographically independent way'" (Scornavacca & Barnes 2008:231). Many organisations claim to function in this way, yet, it does not make a difference to the way that their employees interact with each other or with the rest of the organisation (Basole & Rouse 2007).

If an organisation wants to expand into becoming a mobile enterprise, then, at least a part of the company will need to be transformed. More precisely, it will necessitate a company to rethink; how business is conducted and administrated, how employees interact and collaborate, the methods of accessing corporate resources and the enterprise's adaptability (Barnes 2003; Rouse 2005). By building on this suggestion, Basole and Rouse (2007:481) propose "that mobile enterprises exhibit higher levels of access, interaction, and adaptability than their static counterparts do" and this allows them to respond and execute faster to changing market conditions. They have represented this with a framework in Figure 4. The further the circle moves from the origin in the centre, the greater the levels of enterprise mobility (Basole & Rouse 2007). This effectively depicts enterprise mobility to be independent of location. Enterprise mobility is founded on the processes and technologies which enable uninhibited access to organisational resources and as illustrated in Figure 4 this will improve the levels of adaptability, access and interaction involving the employees and the entities that interact with the organisation, such as customers, partners and suppliers (Basole 2005a).

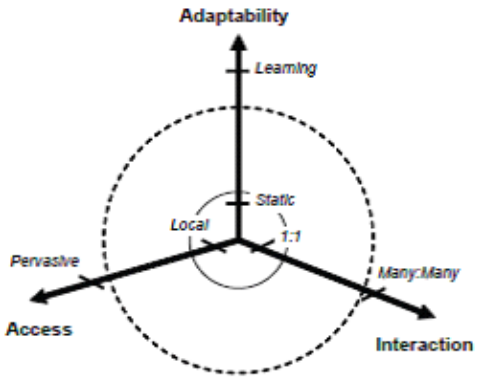

Figure 4: "Dimensions of the mobile enterprise" (Basole & Rouse 2007:481)

2.3.2 Mobile transformation

Not only has mobility provided improved productivity, enhanced efficiency, increased revenues and brought convenience benefits to the organisation, but it has also led to a complete transformation of business practices (Scornavacca & Barnes 2008). There has not been a lot of the empirical research that investigated the impact which mobile transformation will have on a company, but some researchers have identified certain process enhancements (Basole 2004). These enhancements are divided into four categories as described below:

- **Mobilisation -** Mobilisation is the term for the procedure whereby all the organisation's data and processes are gathered together and published in a format that is accessible "anytime, anywhere" to mobile devices. This procedure will already increase the sense of convenience and satisfaction

encountered by end users (Basole 2005b). It refers specifically to the degree of 'geographic independence' experienced by enterprise workers (Scornavacca & Barnes 2008). It can also be described as exerting the quality of temporal and spatial independence (Basole 2004).

- **Enhancement -** The enhancement phase is a step further than mobilisation and refers to a foundational redesign of the firm's processes and to the development of new processes that are capable of benefiting from the unique benefits provided by mobile devices (Basole 2005b; Scornavacca & Barnes 2008). It has been proven that innovation in mobility will lead to radical changes in the business model (Wu & Hisa 2008).

- **Reshaping -** The process of reshaping refers to a progressive phase where mobility has become an important part of the firm's competitive advantage. It becomes innate in the business strategy of the firm and it initiates a snowball effect in the reshaping of processes (Basole 2005b). In this phase, work practices of employees are actually shaped by the functionalities which the mobile medium provides (Scornavacca & Barnes 2008).

- **Redefinition -** Redefinition is the final phase of organisational transformation and it refers to the proliferation of entirely new ways of doing business and the establishment of new capabilities of expertise. In this phase the business strategies are shaped around mobility and this redefines entire industrial markets (Basole 2005b). It describes the value proposition in which the competencies of the organisation have a transforming effect even in the market place (Scornavacca & Barnes 2008).

The literature all agree that if mobile transformation is to be achieved in an organisation, then it must be coupled with a comprehensive mobility strategy and successful mobility adoption (Basole 2005b). The different levels of business transformation are dependent on how mobility is deployed. Different improvements concerning: the automation of business procedures, the collaboration and networking between people, deploying mobile business processes, transforming relationships with customers and suppliers and establishing new streams of revenue, will all have an effect on the level of transformation achieved by the firm (Scornavacca & Barnes 2008). Mobility provides an abundance of worthwhile value propositions that will fundamentally transform a business into a superior working entity (Basole & Rouse 2007).

2.4 The unique characteristics of SMEs

South African SMEs are becoming the backbone to economic development throughout the country. The success of SMEs is dependent on healthy finance

availability, investment and development in ICT capabilities and innovating approaches to operational activities (Johnston et al. 2008). “This includes … the investment in and the adoption of technology efficiencies and to access markets by creating new business ventures, innovation and capabilities that allow them to achieve business and strategic value and competitive advantage” (Johnston et al. 2008:1043). It is generally understood that SMEs are constrained by restricted resources pertaining to time, money, knowledge concerning management, marketing, information technology and skill competencies (Johnston et al. 2008; Dyerson et al. 2009). Consequently, this differentiates their information technology (IT) adoption requirements from larger organisations (Ghobakhloo et al. 2012). The deficiencies in skills are generally beset with poor IT awareness and know-how. This places small businesses at a disadvantage when compared to larger organisations (Blili & Raymond 1993). SMEs are characteristically deprived of the necessary skills to understand, plan for and implement IT. They are also reluctant to make large IT investments and technological updates (Dyerson et al. 2009). Much of their investments are necessities for “meeting bottom line issues of cost and productivity but little use is made of potential strategic applications” (Dyerson et al. 2009:39).

According to the literature, SMEs also rarely indulge in management processes such as financial analysis, business forecasting, formal strategic planning or project management (Blili & Raymond 1993). SMEs usually lack the skills to consider, plan for and implement ICT in order to seize strategic opportunities (Dyerson et al. 2009). They generally rely on informal short-term planning and dynamic strategies. Their decision-making processes are often operationally focused and they are reluctant to follow standard operating procedures. These qualities place formal mobile ICT strategy formulation at a disadvantage (Ghobakhloo et al. 2012).

Enterprise mobility is not just a trend, it is a movement (Webster 2012). “Mobile ICT clearly offers a plethora of lucrative value propositions that will impact and fundamentally transform business processes, organizations, and supply chains” (Basole & Rouse 2007:485). SMEs should not see the mobility movement as a challenge, but rather as an opportunity. Their employees are already harnessing the efficiency and convenience gains of mobility in their personal lives, therefore the SME can simply harvest from what their employees are already doing (Webster 2012). Using the newly available wireless and mobile technologies, SMEs can leapfrog into the competitive arena. The laggard role of the SME can be reversed by introducing the easy access and value adding mobility services that are now available at a fraction of its previous cost. SMEs also do not have all the legacy infrastructure investments that large corporations still struggle with. Their technological investments are much more flexible and their lack of standardised business models is actually to their benefit because it makes them lither. These characteristics place them at a unique advantage to adopt mobile business procedures (Passerini et al. 2007). Nevertheless, empirical research into the mobile

ICT adoption behaviour of SMEs and its consequent transformational effect are still scarce (Balocco et al. 2009).

2.4.1 IT adoption in SMEs

IT spending in SMEs is still poorly managed and the benefits are poorly understood. For example, the adoption of electronic commerce is as low as 6%. Managers often argue that the initial investment in IT is greater than the ensuing benefits accrued. Consequently, they do not treat such investments with priority (Johnston et al. 2008). It is not only the direct cost of software and infrastructure which seem expensive, but more importantly, the indirect costs such as personnel training and motivation, development expenses, systems transferals and change management, post implementation expenses, the cost of time management and finally the costs associated with maintenance make any IT adoption a costly endeavour for SMEs with restrained financial resources (Ghobakhloo et al. 2012). During the analysis of Italian SMEs, Balocco et al. (2009) discovered that the diffusion of mobile ICT is only reasonably evident in companies with over 250 employees, while in smaller companies technology adoption is still very limited. They deduced that the reason for the poor spread of adoption boils down to a lack of knowledge regarding mobile solutions and significant difficulties in perceiving their value before implementation.

Infrastructural resource scarcity faced by SMEs, does however, have an effect which enterprising managers could use to their benefit. It could cause SMEs to be at liberty to experiment, innovate and approach their market with more of an entrepreneurial spirit than larger organisations are free to do. SMEs are more able to reinvent their business models and operations while larger organisations are bound to being products of their investments due to their fixed hierarchies and higher risk factors (Johnston et al. 2008). In a recent study, Ghobakhloo et al. (2012) found results which are contradictory to what we think we know of SMEs. They found that IT has become indispensible to the normal operation of SMEs. They found that SMEs are continually investing significant financial resources in IT in attempts to attain competitive advantage. They noted that SMEs face their own peculiar but threatening risks with the adoption and development of IS/IT. It has also been found that some South African SMEs “... have recognized that the future of any businesses organization will depend on how well it can generate, disseminate, articulate, manipulate, manage and exploit its knowledge using ICTs. It is through these means that businesses are able to experience increased positive sales and economic growth coupled with new product differentiation to improve the consumer experience.” (Johnston et al. 2008:1043).

Mobile applications can be a tremendous benefit to companies without requiring major investments or inconvenient changes to business operations. For this reason mobility seems to be particularly suitable to SMEs, who are not usually very mature

IT/IS (Balocco et al. 2009). The owner-managers do not usually have the time to identify important business processes. However, the few that do make the time to identify these processes could optimise them with the development of a mobility strategy (Passerini et al. 2007). Research has found that the support and motivational levels of top management, specifically in small businesses, are critical to the successful adoption of mobile ICT (Bharati & Chaudhury 2012). It is true that the owner-managers, for instance, have a distrust of consultants, but the IT vendors are a wonderful source of information and services and then they should be leveraged to the advantage of the SME. They can provide much needed assistance in the adoption of mobility and they can provide other services relating to information systems, architecture, mobile applications and security tools (Dyerson et al. 2009; Passerini et al. 2007).

At present, innovation in wireless and mobile technologies has become very affordable to the small business owner. Thus, they have the opportunity to reverse their laggard role "through easy access and fast adoption of emerging broadband wireless technologies, which offer the opportunities for manageable and sustainable IT innovation" (Passerini et al. 2007:1). They are still required to take the time to plan strategic actions pertaining to the questions of why and when to invest (Coursaris et al. 2008). Sufficient IT investment decisions will improve productivity. It is consequently essential to develop an effectual IT adoption and development strategy for the anticipated performance increase to materialise (Ghobakhloo et al. 2012). IT has the ability to transform the way people do business. This is of specific value for SMEs, since their struggle for survival is more demanding than their larger counterparts (Johnston et al. 2008). There is some evidence, even though it is limited, that SMEs can perform strategic IT planning, although, it is much more familiar for the owner's competency, interests and dislikes to drive the company's use of IT (Dyerson et al. 2009). SMEs are commonly managed by an owner-CEO and it has been found that IT adoption and assimilation are strongly influenced by the owner-CEO's attitude towards such technologies (Bharati & Chaudhury 2012).

2.4.2 Mobility adoption in SMEs

Employees are demonstrating an overall obsession with using mobile devices to obtain information anywhere they go. It is becoming increasingly common for road-warrior workers to be equipped with mobile appliances so that they can complete sales and service calls from any location (Mckay 2010). More than 84% of SMEs are active supporters of mobile technology (Akanno 2013). By 2016, tablets will become a standard device for sales staff, executives and other information workers (Hyeong 2013).

The value of a mobile web presence has not entirely permeated through to SMEs, yet. Only 20% of SMEs that have a website have optimised it for viewing on mobile

devices (Zainzinger 2013). Mobile Internet diffusion is expanding at a rate eight times faster than the Internet adoption did in the 1990s and early 2000's (Modify 2013). SMEs cannot continue to be ignorant of the mobile web movement for much longer because, in 2012, 32% of adults in the UK, used mobile phones to access the Internet on a daily basis and by 2015, more than half the population will own and use a smartphone (also in the UK) (Linamagi 2013). By 2014, more than 30% of internet users in the US will own a tablet device and 52% of the tablet owners say that they prefer executing their e-commerce activities on a tablet rather than on a PC (Mobify 2013).

Mobile marketing is another effective medium since it has been determined that 90% of text messages are read within three minutes of receipt (Linamagi 2013). SMEs are starting to take advantage of this opportunity, because when comparing the marketing cost of printing and delivering letters, or any other more sophisticated mediums of marketing, the cost of sending text messages is an incredibly cheap alternative (Linamagi 2013). The SMEs that have invested in optimising their mobile options have experienced 4 to 5 times better performance from their mobile advertisements than from online advertisements (Akanno 2013).

SMEs report many benefits after adopting mobile technologies. More than 90% have benefited from more flexible work environments and their employees profit from the ability to work from anywhere. More than 60% enjoy key benefits due to increased productivity and enhanced access to necessary information and stakeholders when needed. Finally, more than 45% of SMEs have benefited from improved collaboration, increased decision-making abilities and improved customer responsiveness (LammTech 2008).

Mobility is a continuously evolving, dynamic and hypercompetitive environment (BlackBerry 2010; iPass 2012; Zetie 2005). Such environments create significant challenges to strategic management. Although not all researchers agree, some have suggested that the nature of competitive advantage is temporary rather than sustainable in such dynamic environments (Ilinitch et al. 1996; Eisenhardt & Martin 2000). This suggests that management should focus energy on renewing, rather than protecting sources of competitive advantage (Rindova & Kotha 2001). Dynamic environments nullify the ability of assets, staff products, brand and other resources to uphold competitive position by themselves, as they might have in the past. This dynamic domain requires innovative methods of combining these resources in innovative ways, to acquire additional valuable resources and to dispose of redundant resources quickly and repeatedly to remain competitive (Daniel & Wilson 2003).

2.5 A short discussion of strategy

A definition of strategy which is both broad and would be accepted by any faction is that "strategy is a plan - some sort of consciously intended course of action, a guideline (or set of guidelines) to deal with a situation" (Mintzberg 1987:11). Some distinctive attributes of the strategy is that they are consciously and purposefully developed in advance before the anticipated actions are taken and a central aim is for them to be distinctive from that of their competitors (Markides 2004; Mintzberg 1987). Below, Quinn et al. (1988) provides a fuller description of what strategy is:

> *"Corporate strategy is a pattern of decisions in a company that determines and reveals its objectives, purposes, or goals, produces the principal policies and plans for achieving those goals, and defines the range of business the company is to pursue, the kind of economic and human organisation it is or intends to be, and the nature of the economic and noneconomic contribution it intends to make to its shareholders, employees, customers, and communities" (Quinn et al. 1988:43).*

Strategy requires management to make very tough decisions based on only a few parameters. The parameters are indispensable because they define the boundaries within which employees are trusted with the freedom to operate autonomously and to experiment. The parameters also state the organisation's strategic position within its industry (Markides 2004). To define these parameters "a company needs to decide on three main issues: *who* will be its targeted customers and who it will *not* target; *what* products or services it will offer its chosen customers and what it will *not* offer them; and *how* it will go about achieving all this – what activities it will perform and what activities it will not perform" (Markides 2004:6).

Some of the ideas on strategic planning proposed by Markides (2004) are consistent with the earlier research completed by Madan et al. (2003). They discovered that after the 'dot-com boom-bust', there originated a transition in strategic approach. Before, companies participated in a risky, top-down technology-led approach to strategic planning which was founded on a principle to discover and implement killer applications. Strategic planning has evolved to a lower-risk, bottom-up, organic approach which is founded on the principle of providing open and enabling infrastructures according to the necessity of business goals (Madan et al. 2003).

The next sections will discuss the three strategic theories which were evaluated as underpinning theories for the research.

2.5.1 Strategic information systems planning (SISP)

SISP is one of the more typical and influential frameworks in strategic planning. It is an important topic for an organisation's management (Mocker & Teubner 2005).

Much of the strategic thinking that forms the foundation of the SISP practices originated from the research of Porter & Millar (1985), who focused on expressly describing the role of IT as a strategic resource instead of a mere support service and proving how information can confidently be used in creating and sustaining competitive advantage. A simple as well as one of the earliest definitions of SISP is describing it as the method of categorising a portfolio of computer-based applications which would enable the firm to execute its business plans and reach its business goals (Simonsen 1999). As most of the strategic planning used in the 1990s, SISP also used to be a long-range method of planning for computer-based applications (Lederer & Sethi 1991). More holistically, SISP refers to the process of planning for the effective long-term management and optimum influence of *information* - in the form of IS and IT, both through computer technology and telecommunications (Ward & Griffiths 1998).

In most large organisations, SISP is one of the highest-priority concerns in management agendas (Watson et al. 1997 in Mocker & Teubner 2005). The value and significance of SISP is based on the well-researched strategic benefits which could lead to competitive advantage (Mocker & Teubner 2005). Some of the many benefits are that information systems (IS) can change an organisation by lowering cost throughout the value chain; it can enable market differentiation and initiate innovative businesses. IS are also progressively influencing organisational products and processes. Some authors hold to the notion that, in this way IS/IT is becoming a ubiquitous source of competitive advantage (Porter & Millar 1985). “The ability of ICT to provide ‘strategic advantage’ has been actively debated through numerous studies focusing on ICT value, its assessment and articulation and has yielded paradoxes” (Benjamin et al. 1984 and Ciborra 2002 both in Madan et al. 2003:[2]). This paradox will be covered more extensively later in this study in the section discussing DCs and its influence on sustained competitive advantage (*3.4.3 Sustained competitive advantage*). However, it is agreed that IT cannot be neglected without risking the loss of strategic opportunities or wasting resources on duplicated efforts and incompatible systems (Lederer & Salmela 1996; Ward & Griffiths 1998).

2.5.2 Porter’s five forces and the value chain

Porter's (1985) Theory of Competitive Strategy (five forces) is based on the realisation that an organisation exists within a particular industry and in order to succeed it must sufficiently manage the competitive forces in that industry (Ward & Griffiths 1998). The theory uses concepts which were developed in economics to determine a market’s attractiveness. It addresses those factors which are close to the organisation in their ability to affect its prosperity. By understanding the five forces, an organisation can determine its position in its marketplace. If there comes a change in any of the forces, then the company would be forced to reassess its position (Akbari 2012).

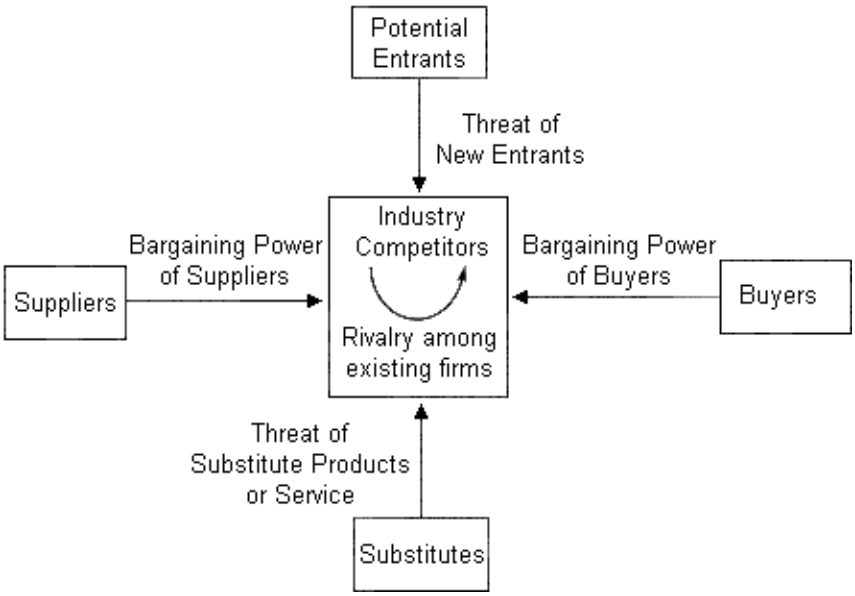

Figure 5: The five competitive forces that determine industry profitability (Porter 1985:6)

An enterprise interacts with customers, suppliers and competitors. But, the industry also has the threat of new entrants into the marketplace or of substitute products and services. Consequently, to thrive in its environment it is necessary to comprehend the different interactions and to understand their implications so that competitive advantage can be seized when the opportunity presents itself (Ward & Griffiths 1998).

The main independent constructs of the theory are:

- Supplier power – This is an assessment of the number of available suppliers and their control over the organisation. What is the risk of suppliers driving up their prices and how capable is the organisation at switching between suppliers (Porter 2008)?

- Buyer power – How much control does the buyer have to drive prices down? This will be controlled by the number of available buyers and the cost of them switching to other products. If the organisation has few buyers, then they will be in a position to dictate terms to the organisation (Porter 2008).

- Competitive rivalry – The important thing here is to assess the number of competitors and their individual strengths. The more competitors, the less power the organisation will have over their market. On the other hand, if they have fewer competitors then they will have great strength in their market (Porter 2008).

- Threat of substitution – This is the ability of customers to find a different method of acquiring or receiving that which the organisation produces or provides. Manual services might become automated, or a service might

instead be outsourced. It is necessary to assess whether it is easy to substitute products or services. If it is, then it weakens the organisation's position and power in the market (Porter 2008).

- Threat of new entrants – Power is also weakened if it is easier for new competitors to enter the market. If the entry cost is low, or if the economies of scale are already in place, if there are no sophisticated machinery or technologies in place or if a competitor can quickly enter the market, then it weakens the organisation's position. If there are some existing and durable barriers in place, then the organisation will enjoy a favourable market for longer (Porter 2008).

The dependent construct of the theory is determined by an above normal profitability. "The five forces determine industry profitability because they influence the prices, costs, and required investment of firms in an industry - the elements of return on investment" (Porter 1985:5). As mentioned before, the 5 forces model aims to illuminate threats and opportunities in the industry so that a company can adapt to any changes in the market and seize a greater income bracket (Ward & Griffiths 1998). The 5 forces is a tool that enables businesses to analyse their industry forces so that they can develop a strategy to manipulate the forces to their advantage (Porter 1985).

2.5.3 An alternative approach to strategy

Strategic processes such as the SISP and Porter's five forces or value chain models have been the most relied on strategies in industry (Duhan et al. 2001). It is also possible to imagine that these strategies have formed the foundation on which most commercial mobility strategies have been based (iPass 2012; BlackBerry 2010; Duhan et al. 2001). For the most part, these strategies can more accurately be described as the formal strategy formation process rather than the informal, inherent, historically dependent and tacit strategic creation which is most common in SMEs (Daniel & Wilson 2003; Hussin et al. 2002). Mintzberg (1987) first proposed the idea that strategy has two divergent avenues – the first is to take strategy as a plan ('strategy-as-intend') and the second is to take strategy as a pattern ('strategy-as-implemented'). Following in his footsteps, scholars have started to investigate the processes by which firms reconfigure resources in the pursuit of competitive advantage and referred to them as DCs (DCs) (Daniel & Wilson 2003; Teece et al. 2007). In dynamic markets, such as the environments of the SMEs, such capabilities are regarded as vital to the success of firms. This belief is adhered to such an extent that it is believed that the threat to firms does not originate from competitors, but rather internally from its own inability to capitalise the development and sustainment of effective DCs (Eisenhardt & Martin 2000). In keeping with the view of the two different meanings of strategy as appropriated by Mintzberg (1987), DCs can also be

used both to strategically plan the creation or acquisition of capabilities and resources so that sustained competitive advantage can be achieved, or it can be used to analyse the firm according to its organisational routines and patterns (Augier & Teece 2008; Teece et al. 2007). Examples of such routines can be categorised as resource integration, reconfiguration, acquisition and elimination. This is presented below in Table 2:

Table 2: Categories of DCs (Chen et al. 2008:368)

Dynamic capability	Organisational routines	Description
Resource integration	• Product system development routines • Strategic decision-making for resource integration	• Some DCs integrate resources, such as managers combining various expertise to make choices for organisational changes, create products, or systems.
Resource reconfiguration	• Routines for knowledge replication and brokering • Resource allocation routines • Knowledge creation routines • Resources evolution routines • Resource transformation routines	• Some DCs reconfigure resources within firms, such as managers replicating, transferring and distributing knowledge assets • Some DCs involve resource evolution routines, which enable the adaptation of existing capabilities and capacity • Other DCs involve resource transformation routines, which enable learning from a combination of both internal and external sources
Resource acquisition and elimination	• Alliance and acquisition routines • Resource elimination routines	• Some DCs involve alliance and acquisition routines that bring new resources into the firm from external resources • Some DCs involve resource elimination routines that discard resources no longer providing competitive advantage

Strategic processes such as the SISP and its affiliated strategic management frameworks can deliver advantageous results, but the resource-based view and DCs can also yield its own benefits to strategic planning (Duhan et al. 2001). In the 1990s it was asserted that companies should recognise and exploit ‘core competencies’. Core competencies is a collective name which refers to the company focusing on particular skills which involves continued learning and the coordinating of a diverse range of specific competencies (Prahalad & Hamel 1990). The emphasis is on assets and capabilities that are intangible and may include skills, technologies and other competencies. When they are deployed in coordinated methods, they form the core competencies of the company. The theory is that firms actually compete against each other according to the abilities achieved through these core competencies

rather than with the actual products themselves (Duhan et al. 2001). While Porter and the other SISP methods proposes that competitiveness is dependent on the structure of the industry, DCs and the resource-based view argues that it is the way in which a firm can differentiate themselves from competition which provides true competitiveness (Dyer & Singh 1998). Accordingly, DCs, and its parent theory, the resource-based view (RBV), both follow the example set by Prahalad and Hamel's (1990) core competence perspective by encouraging firms to "exploit the existing capabilities through 'competence leveraging'; attacking new markets or strengthening positions through focused development. They can engage in 'competence building', creating new capabilities or developing new abilities to coordinate existing ones" (Duhan et al. 2001:28). While the structural approaches to strategic analysis cannot explain why two identical firms can have different successes in IT adoption, DCs and the RBV theory can. These theories focus on the internal context of the firms and where the structural frameworks fail these theories can explain why some firms have more success with IT adoption than others (Caldeira & Ward 2003).

All authors of strategic literature recognise the changes in the business environment coming at a rapid and dynamic pace. To cope with such changes, firms need to continually reorganise, acquire and transfer organisational capabilities and resources (Teece et al. 2007). DCs is the aptitude of a firm in distinguishing innovative market opportunities, its skill in assigning strategic importance to these capabilities and resources and the methods which it uses to renovate competencies (Wu & Hisa 2008).

2.6 Strategic planning and mobility management

In order to achieve a successful transition from a traditional office environment to an anytime, anywhere mobile office, it is necessary to execute an effective mobile strategy which will maintain a balance between the people, processes and technology involved (Liu 2010). It is easy to imagine that most of the conventional academic and practitioner approaches to strategic mobile planning have strong roots in both the SISP and Porter's five forces and value chain (BlackBerry 2010; iPass 2012; Kornak et al. 2004; Lederer & Salmela 1996; Porter 1985). The insistence for mobile computing capabilities is continually increasing. It demands from managers to contemplate a wide range of issues like device maintenance and management, opportunities for application development and a whole host of new security concerns. The mobility platform is becoming a significant provider of value. Even many of the companies which are reducing their IT expenditure are increasing their investment in mobile ICT (Kontzer 2012).

2.6.1 The mobility strategy

As discussed earlier in this dissertation, mobility offers attractive opportunities, yet businesses should not attempt to deploy it without delay. At least not until they have an implementable mobile strategy (Kornak et al. 2004). It should be a high priority to plan adequately before mobility implementation. A well-designed mobility strategy is essential if a company is to consider which mobility projects to pursue and what priority to assign to each project in order to produce the best results (Johnson 2007). Mobility strategies will vary from each other due to the influence of different factors such as: the firm's business objectives, the current mobile deployments, the different priorities placed in mobile applications, mobile security policies, available funds and the way in which employees perceive mobility (BlackBerry 2010). As a guideline, the mobility strategy should incorporate aspects which would influence well-defined business objectives. Some sources suggest that to accomplish this, it is necessary to adhere to a structured strategic planning process (Kornak et al. 2004). Kornak et al. (2004:31) suggests the following stages:

- Defining the organisation's wireless direction/strategy
- Creating a prioritized portfolio of wireless initiatives
- Charting a roadmap for the deployment of high priority initiatives
- Validating the approach via a proof of concept
- Implementing a strategy
- Monitoring and adjusting the strategy

A company diminishes the value of a mobile strategy at their own peril. A mobile strategy could save the company from the increased costs associated with incompatible technologies; it could ensure that all issues concerning management and security are prepared for; it could ensure that there is support available for all the mobile solutions; and it would force the company to consider the implications that mobility will have on its policies (Zetie 2005). The responsibility of SME managers to develop and implement efficient mobile strategies is becoming increasingly more important, and its relevance has been aptly described by (Thorton 2009:44): "Show me a bad mobility strategy, and I will show you a bad CIO".

An SME can consider different options for managing mobility. They could manage it in-house. However, this is discouraged due to their limited resources. SMEs will have a hard time gathering the necessary software development resources and maintaining the necessary expertise for the administration of the technology and for keeping up-to-date with technology changes (Ghobakhloo et al. 2012). Consequently, outsourcing the management of its mobile solutions is a wise option.

Most academic research encourages the organisation to have a long term mobile strategy and to align all mobile solutions with the strategy (Liu 2010). However, the approaches typified in most research studies are based on highly formal and analytical approaches to IS strategy development which is suited to traditional markets, these approaches do not perform well in turbulent markets. Instead, managers in turbulent markets are encouraged to establish a clear vision and then cultivate fertile ground for the IT strategy to develop in a more emergent manner (Daniel & Wilson 2003).

2.6.2 Mobile employee management

The organisation should carefully and comprehensively analyse its employees. It should identify those employees who will benefit from mobility and judge them according to the criteria of business needs, location awareness and information usage requirements (Liu 2010). There are employees whose jobs require them to be mobile - out of the office and in the field. They can be referred to as mobile workers. These mobile workers require access to information systems so that they can perform tasks such as real-time scheduling, execute sales, operations procedures and provide immediate response to queries. Other employees can be referred to as information users because they are more dependent on information. That means that they have existing requirements of information access that need to be replicated on the mobile platform. These employees are the road warriors and roaming users that need to be in touch with events at the office at all times and from any locations. They are heavy users of laptops, tablets and smartphones (Zetie 2005).

It is the users of the organisation that will have to interface with the new mobile technologies on a daily basis and consequently their competence and approval of the new technology is important (Basole 2005a). A common roadblock such as technophobia can easily be overcome if sufficient training is provided (Townsend et al. 1998). Every company should realise not to frivolously increase technological infrastructure without strategic purpose. Any increase in technology does not automatically mean an increase in productivity if it is done without purpose, but might even risk hampering employee productivity (Sorensen 2004; Sørensen & Gibson 2004). Organisations can significantly improve their effectiveness and save costs if they take sufficient care to evaluate the specific mobile requirements of their employees (Friedenberg 2004; Liu 2010).

2.6.3 Mobile process and technology management

The success of a mobility investment is mostly dependent on how carefully it is aligned with both business and IT drivers. A successful mobile strategy should concentrate on ‘mobilizing’ the most important business processes and it should

include conducive steps on how to discover such processes (BlackBerry 2010). For a truly successful mobile experience, it is necessary to analyse all the firm's current processes and then to determine which processes most benefit the firm by being mobilised (Basole 2005a). Effective virtual teamwork and collaboration is dependent on the development of horizontal organisational structures (Townsend et al. 1998). Mobility adoption is also more effective when the existing structural and non-structural values and goals of the enterprise are compatible with the inherent characteristics of mobile work procedures (Basole 2005a). It is recommended that organisations invest more resources into nurturing collaborative cultures and eliminating the traditional hierarchical structures of command and control (Sorensen 2004).

The organisation is only sufficiently ready to make technology decisions once they have profiled the workers and mapped the processes. Technology decisions include device selections for every type of mobile worker, communication requirements, security considerations and technological support (Liu 2010). Technological management refers to the firm's technical and managerial capacity to adopt and manage new technologies (Basole 2005a). If a firm seeks to be transformed into a truly mobile work environment, then it needs to find a way to manage a variety of mobile devices and technologies. To achieve a successful technological integration and overcoming all the infrastructure clashes, connectivity or ergonomic restrictions, is a major challenge (Reif et al. 2001). Each firm will approach the mobile problem from different architectural starting points, but the basic technological areas to consider are: devices, wireless networks and connectivity, an enterprise-wide technological integration, security management, support, application packages and updates, usage policies and custom application development (Zetie 2005). It is interesting to note that organisations are encouraged to support multiple platforms. It is also recommended that the mobile architecture should be scalable to allow for future migrations to new platforms (Liu 2010).

2.6.4 Mobile security management

Mobility has introduced many new challenges for IT departments, none of which is as critical as the matter of security. It has become an unavoidable challenge. Most organisations are experiencing the same complexities while attempting to become more capable at administrating the management and security of the growing mobile user population and asset distributions (Forrester Research 2009). Mobility has established a variety of new threatening scenarios against which organisations should protect themselves. When planning for mobility it is necessary to plan an exhaustive security strategy, update policies and efficiently prepare for the implementation of both (Passerini et al. 2007). It is also a good idea to educate users regarding the new security implications and the potential risks which mobile devices pose to the organisation (Zetie 2005).

2.7 Existing research in DCs

New innovations are increasingly changing the conditions of the environments in which firms operate and they need to respond to these market changes by developing new capabilities that enable them to function competitively (King & Tucci 2002). The ability of the firm to react to the new market changes is defined as part of the organisational capabilities called dynamic capabilities (DCs) which are developed from the older resource-based view (RBV) (Eisenhardt & Martin 2000). DCs approach organisational abilities from an intriguing angle. “In this view, firms possess bundles of costly-to-imitate resources that are regarded as fundamental drivers of superior performance” (Bharadwaj et al. 1999:378). Organisational resources and strategic routines are combined to form new resource configurations as the market requires (Teece et al. 2007). Changes in the market cause disruptive waves which obligate firms to master competencies into advantageous capabilities if they are to survive (King & Tucci 2002). DCs provide a key opportunity for practitioners for conceptualising new customer needs, for detecting new openings for research and development, for applying discipline to investment decisions for placing emphasis on growing new competencies (Katkalo et al. 2010). The definition and the origin of both DCs and RBV will be discussed in detail in chapter 3.

2.7.1 Examples of DCs and IS/IT

Although there are many examples in the literature regarding studies into different combinations of either DCs, IS/IT, strategy or SMEs, the literature reviewed revealed that there are very few existing studies that focus on holistically understanding the strategic effect of *mobile ICT* on the transformation of SMEs according to the theory of DCs (Bullon 2009; Caldeira & Ward 2003; Chen et al. 2008; Daniel & Wilson 2003; Duhan et al. 2010; Eze et al. 2013; Katkalo et al. 2010; Liang et al. 2010; Raymond & Bergeron 2008; Trainor et al. 2011; Wu & Hisa 2008). Small businesses are considerably different from large enterprises but most theory and management frameworks have been tailored to the demands of large organisations and they frequently do not fit the particulars of SMEs (Caldeira & Ward 2003). As Bharadwaj et al. (1999:379) so poignantly put it: “what is missing, is an integrative conceptualisation of IT [in this case mobile ICT] capability as a multi-dimensional construct encompassing both the technical and organisational dimensions”. Essentially, DCs is concerned with change, this refers to the changing opportunities in which a firm has to redeploy and renew its resources and competencies with the ultimate aim of cultivating a competitive advantage and remaining competitive in a dynamic business environment (Wu & Hisa 2008). “SMEs must be flexible and readily adaptable to change, be it competitive, strategic, operational or technological in nature” (Raymond & Bergeron 2008:591).

The importance of studying DCs was demonstrated by the study of Rosenbloom (2000) when he discovered that, during the 1950s, the NCR Corporation only survived the rigours of the electronic era thanks to their ability to 'actualise DCs'. Lawson and Samson (2001) applied the theory of DCs to study innovation. They concluded with a model that can operationalise the innovation capability which they deemed to be necessary if a firm requires to innovate successfully in a dynamic and turbulent environment.

DCs require that the SME spends efforts on discovering exclusive IS attributes and resources that may provide them with superior performance (Caldeira & Ward 2003). Some of the seminal researchers believe that these capabilities are built through experience rather than through marketable acquisitions (Teece et al. 2007). They place a lot of responsibility on the shoulders of managers to acquire and act on experiential or tacit knowledge (King & Tucci 2002). The methods which managers use to intensify, alleviate or restrain the implications of experience remains an interesting theoretical and empirical study for further research in DCs (Eisenhardt & Martin 2000; King & Tucci 2002). The importance of managerial experience is necessary to businesses at any level of competitiveness and can be used to navigate the rapid market waves of dynamic market and technological change (King & Tucci 2002). The debate whether IT has an influence on sustainable competitive advantage is a provocative subject. Yet, when the RBV was used to investigate the influence of information technology on competitive advantage, it was found that managerial IT skills was the only attribute which positively influenced sustainable competitive advantage. Between the four different attributes of IT investigated, namely the availability of technical IT skills, access to capital requirements, proprietary applications or technology and managerial IT skills, the latter was the only attribute which could be empirically proved to favourably affect sustainable competitive advantage (Mata et al. 1995). The results of Caldeira and Ward's (2003) study also reflected similar conclusions. They found that only two factors have a genuine influence on the successful adoption of IS/IT. Those were: the IS/IT competencies (which refer to the availability of people with related knowledge and skills) and the viewpoints and attitudes that the SMEs' leaderships had towards the adoption and usage of IS/IT. Caldeira and Ward found that the firms which were less successful generally expended more effort on the perceived quality of the IT systems they were implementing, rather than the requirements to develop in-house IS/IT competencies. The successful firms on the other hand, placed emphasis on obtaining expert help to increase their in-house knowledge before they attempted to discover solutions to meet their business requirements (Caldeira & Ward 2003).

The reason for the pervasive influence that IT management skills exercises as a dynamic capability is because it is most often diversely distributed across different firms. Consequently, each firm possesses a measure of uniqueness in the configuration of its management team. Moreover, the management skills share the unique histories and evolution of their particular firms, they reflect the unique talents

and routines in an organisation and they are a function of the socially complex culture (Mata et al. 1995). These attributes make managerial IT skills a unique and valuable dynamic capability which would be difficult to replicate or imitate by a different firm with a different history and different inherited patterns of management.

Daniel and Wilson (2003) studied the DCs necessary for an e-business transformation. The capabilities which they identified were: a short cycle for strategy implementation, the ability to make valuable changes to the business model based on insubstantial and uncertain information, boosting change management both internally and externally related specifically to strategic change, iterative approaches to creating new services and adding value to customers, the ability to reengineer sales/service procedures, seamlessly integrating new technology with existing systems without disrupting innovation, the ability to integrate delivery across different channels to permit multi-channel service and lastly, closely linking corporate strategy and e-business strategy formulation (Daniel & Wilson 2003).

It has also been found that DCs improve the strategic flexibility of firms, especially of those competing in dynamic markets of whom flexibility is a prerequisite (Rindova & Kotha 2001). Other DCs, associated with having sufficient knowledge management are broadly categorised as: improved operations management thanks to well-orchestrated project management, improving the physical knowledge base through developing research skills, increasing marketing effectiveness and customer support through specific methods related to communication skill improvements, increasing collaboration and teamwork also through the improvement of communication management and specific competencies to increase control and planning (Duhan et al. 2001). DC is also a good guiding theory to examine the strategic information system alignment process and to comprehend and resolve challenges in realising sustained alignment (Chen et al. 2008).

“The resource-based view (RBV) provides a sound foundation for the examining of how IT and complimentary resources can be bundled to form advantage-generating capabilities” (Trainor et al. 2011:162). As Wu and Hisa (2008) explains, some of the benefits provided by mobility are: convenience, real-time information delivery, enabling employees to be mobile, location tracking ability and personalisation. An essential capability would therefore be to recognise the correct market segments which could best disseminate the benefits provided by mobility. Wu and Hisa recommend detailed marketing strategies in order to make this identification possible. They also concluded their study with a list of four core business capabilities specific to mobile commerce, which if combined together can exact major change in a business model. The list includes: envisioning customer value, executing business innovation, matching technological functionalities with economic opportunities, building relationships.

In all cases it is not the DCs which provide value to the organisations. It is rather the way in which it contributes to competitive advantage. To achieve this, two of the

important attributes that DCs require is that resources and capabilities are heterogeneous from those possessed by competing firms and that the resource capabilities are immobile, meaning that they are distinguishing factors with longevity (Barney 1991; Daniel & Wilson 2003; Mata et al. 1995). Teece et al. (2007) consider DCs to be exclusively unique to individual firms, a reflection of the history and idiosyncrasies of that firm. In contrast, while still maintaining that DCs are idiosyncratic, Eisenhardt and Martin (2000) believe that particular DCs share considerable similarities across firms and industries. More particularly, they found that the similarities were related to the most effective methods of doing certain practices and they referred to them as 'best practices'. It is this point that motivated this dissertation to discover those best mobile practices that can lead to company wide mobile transformation. There are also certain practices which could favourably influence the development of DCs. Some of these practices were identified by Daniel & Wilson (2003) when they studied the DCs required for successful e-business transformations. They define the following approaches to DCs:

- The companies had to find a balance between acquiring knowledge before projects/phases and learning through experience during projects/phases.
- In a rapid changing environment it is important to revisit the strategy regularly.
- It was also good practice to create cross functional teams to ensure that all the facets of the business requirements were covered.
- Carefully managed outsourcing enabled the availability of certain skills and incited innovation while still maintaining control and strategic flexibility.
- It is also good practice to develop flexible architecture to prevent any future roadblocks to deploying innovations.
- Finally, developing IS competencies in all of the firm's staff through suitable training will also improve the development of DCs.

2.7.1.1 SMEs

Strategic Information Systems planning (SISP) in SMEs is still very immature (Duhan et al. 2001). This is due to the significant differences between SMEs and large enterprises. Strategic theory and management frameworks were derived from the experiences of large enterprises and the emphasis of their suggested methods frequently do not fit the context of small businesses (Caldeira & Ward 2003). Both the studies of Blili & Raymond (1993) and Levy et al. (1999) explored the applicability of IS strategy frameworks to SMEs. Both studies found the five forces and the value chain analysis models to be of value but they concurred that the usefulness of these models will increase if their core focus could be adapted to the

needs of small businesses. Since investigations into the IS strategic planning processes of SMEs are already scarce when considering the mainstream SISP and other structural planning frameworks, it can be expected that similar research using the significantly younger DCs and RBV models will be even harder to come by (Blili & Raymond 1993; Levy et al. 1999). Empirical research that uses the foundation of the RBV or DCs is mostly tested in the contextual environments of large firms. There has been significantly less research done in the context of SMEs regarding the role of strategic planning or the strategic impact of IS resources with the same theoretical foundation (Duhan et al. 2001).

Both DCs and the RBV are instinctively appealing for studying IS in SMEs. SMEs tend to be small businesses that do not have enough influence to restructure their industry in order to gain competitive advantage. They generally operate in a market which is already mature and consequently they are unable to influence it at price or quantity level. IS can provide certain collaborative advantages between employees, customers and suppliers as suggested by Porter's theory. However, neither Porter's value chain, the 5 forces model, nor the other structural theories can explain why one SME would rise above the others with innovative utilisations of IS. On the other hand, both DCs and the RBV are focused specifically on the context of the firm - and for instance, both these theories can describe the impact that factors such as the attitudes of the SME's managers and their related IS experience will have on the success and innovation of an SME (Duhan et al. 2001).

Raymond & Bergeron (2008) investigated what the performance outcomes are when e-business capabilities are aligned in SMEs and the specific effect which it will have on business strategies. Their research is an investigation to determine whether alignment between the e-business capabilities and business strategy will result in better performance in terms of growth, productivity and profitability. The conclusion to their study confirmed their hypothesis (Raymond & Bergeron 2008). It has also been confirmed by other researchers that DCs are not only critical to both create and strengthen IT resources but they will also positively influence the process of aligning IT with the business' strategic objectives (Chen et al. 2008). Caldeira and Ward (2003) used the RBV to interpret the successful adoptions of IS and IT in manufacturing SMEs. They concluded that the internal context of an organisation has a large influence on the competencies which lead to successful IS/IT adoption and usage. It is exactly because the internal context turned out to be such a detrimental factor that the RBV turned out to be a better analysis theory than the structural views of strategy would have made. The structural views of strategy would have overlooked the more sensitive and tacit facets of the firm's internal context and rather placed the emphasis, as they normally do, on the external factors of environment and industry (Caldeira & Ward 2003).

SMEs typically operate within complex and turbulent environmental conditions where they are not the most influential players (Daniel & Wilson 2003). Therefore, the

strategic actions and decisions are typically dynamic out of necessity. This is in contrast with the formal and analytical approaches to IS strategy which are recommended for the strategic process by the acclaimed and conventionally adhered to strategic heralds and developers (Earl 1993; King 1978; Ward & Griffiths 1998; Ward & Peppard 2002). In the context of SMEs, strategies tend to develop in a more emergent manner and of all the strategy development frameworks and theories DCs inherently understand and communicate this necessity best (Daniel & Wilson 2003). Even, while considering the merit of strategic planning, Mintzberg (1994:112) agreed that "sometimes strategies must be left as broad visions, not precisely articulated, to adapt to a changing environment". SMEs are characterised by a variety of small strategic decisions and actions which are acted out both dynamically and tacitly (Blili & Raymond 1993; Dyerson et al. 2009; Ghobakhloo et al. 2012). Throughout the organisation these decisions and actions are shaped by the strategic history and previous business objectives followed by the SME. The analysis with DCs is able to identify these decisions and actions to be immobile to some extent because of the uniqueness of each SME's history and consequently they do offer the opportunity for sustained competitive advantage in differing degrees (Daniel & Wilson 2003).

2.7.1.2 IT capability

The use of DCs as an analysis framework to study the impact of the IT capability on organisations has not been thoroughly researched, but there is some useful knowledge that can be extrapolated from the few existing studies (Bullon 2009). Previous research have noted that the IT capability cannot be viewed as an isolated set of technological functionalities, instead it is a capability which spans across the entire enterprise (Bharadwaj et al. 1999). The broad influence of the IT capability explains why the topics discussed in the studies of the previous authors were so diverse. They focused on the nature of DCs, related antecedents, relevant outcomes, associated procedures and the differences between dynamic and operational capabilities (Bullon 2009; Helfat et al. 2007). Interestingly, there are also several authors who have concluded that DCs is not the exclusive source of competitive advantage, but that new combinations of resources and operational capabilities can also instigate competitive advantage (Bullon 2009; Eisenhardt & Martin 2000; Helfat et al. 2007; Makadok 2001).

A key component to be able to exploit IT capability is to possess a clear understanding of its critical components and how they fit together to shape business strategy and transformation (Bharadwaj et al. 1999). The influence of the IT capability on competitive advantage is dependent on sustaining and growing healthy investments in IT (Bharadwaj 2000). A foundational belief of DCs is that the correct application of the theory is bound to improve competitive advantage. This has captured the attention of many researchers and the research that combines DCs

(and the RBV) with IT is almost unanimously focused on discovering its effect on firm performance (Liang et al. 2010). Bharadwaj (2000) was the researcher who developed the idea that IT is an organisational capability. Over a four-year period, he used the resource-based view to examine firm performance and profit ratios in a sample of IT leaders and its comparison to a group of control participants. His empirical findings concluded that from a resource-based perspective, IT capability is a profit generating resource that is difficult to imitate, replicate or substitute (Bharadwaj 2000). However, not all researchers agree. An important point to take notice of, even if it is still under investigation and the results are still ambiguous, is that some researchers argue that IT *investments* may improve productivity, but those benefits in productivity do not necessarily lead to improved profitability (Bullon 2009). Technology resources and capabilities may visibly enhance efficiency and performance but it will not always increase financial performance directly (Liang et al. 2010). As Raymond & Bergeron (2008) found with investments in e-business, those investments on their own were not enough to improve business profitability. What was necessary was for firms to improve their technology management capabilities from a more holistic perspective. It has also been concluded by other researchers that the resource-based view of the firm clearly indicates that if we want to investigate the IT-based sources of sustainable competitive advantage, we must remove our focus from the technology itself and rather zoom in on the functions of organising and managing the information technologies within a firm (Mata et al. 1995). Most authors maintain that the application of DCs as an analysis method in IS has the beneficial potential to detect key drivers of superior business performance (Wade & Hulland 2004). A point which is very valuable in a discipline whose contribution to business value is often questioned.

It may not be feasible for small businesses to develop all the necessary IT capabilities internally. They would benefit if they can obtain high quality IS experts from external organisations to provide guidance and to increase their relevant knowledge (Caldeira & Ward 2003). “Due to the lack of internal IS expertise, small businesses need to engage experienced consultants and IT vendors to undertake their information systems implementation” (Thong 2001:154). Using IT to gain a sustained competitive advantage is not an easy endeavour at all. Indeed, if it was easy to utilise IT in this way, then it would not be imperfectly mobile and consequently not a true source of sustained competitive advantage (Mata et al. 1995).

There is a distinction between *dynamic* IT capabilities and *operational* IT capabilities, as elaborated on below.

Dynamic IT capabilities - The factors which are necessary to declare any asset as a dynamic capability depends just as much on the organisational context as on the attributes of the asset itself. On its own, an asset cannot be declared to be a resource or a capability. Resources and capabilities are formed through the

procedures and processes which utilise and manage the asset according to the objectives of the business (Duhan et al. 2001). A dynamic IT capability is the aptitude of a firm to resolutely create, extend, or modify its resources through the use of information technology (Bullon 2009). The contributions, whether positive or negative, of DCs have a far more complicated impact and firm performance than the operational capabilities (Drnevich & Kriauciunas 2011). Any dynamic capability resource must be difficult to create, acquire, substitute or imitate (Duhan et al. 2001).

Operational IT capabilities - Operational or functional IT capabilities are the routine, day-to-day IT activities that an organisation must effectively execute as part of its normal procedure to earn a living (Bullon 2009; Helfat et al. 2007). It appears that these capabilities form the foundation for the rest of a firm's operations (Drnevich & Kriauciunas 2011).

2.8 Concluding summary

The ever increasing adoption levels of mobile technologies are providing unprecedented opportunities for SMEs to benefit from mobility (Scornavacca & Barnes 2008). The technology has become more affordable and its value to the business continues to improve (Basole 2004; Passerini et al. 2007). Mobility provides an abundance of worthwhile value propositions that will fundamentally transform a business into a superior working entity (Basole & Rouse 2007). It is this transformation that is of particular interest to this research study.

Strategic thinking has moved from the conventional SISP and affiliated structural frameworks to a reinterpretation of the field with DCs' view of strategy. Small businesses are significantly different from large organisations and consequently conventional approaches towards theory and management frameworks are not always applicable. Since SMEs generally do not operate at the zenith of their field, their environmental industry can generally be characterised as dynamic and consequently they have to compete with quick decision-making and rapid product or service delivery (Hyeong 2013). The theory of DCs therefore, is a very apt theory both for SME managers to apply in their businesses and for researchers to analyse or interpret transformational progress in SMEs (Caldeira & Ward 2003). The theory of DCs makes provision for managing strategic growth and competitive advantage in high velocity markets (Eisenhardt & Martin 2000). Some researchers of DCs believe that although DCs are idiosyncratic, they do share some similarities across successful firms (Daniel & Wilson 2003; Eisenhardt & Martin 2000). It is these similarities that this dissertation depended upon to identify different mobile DCs across a variety of industries.

Chapter 2 discussed the existing literature concerning the characteristics of mobile ICT, its strategic utilisation and its transformational effect on the firm. It also

discussed existing literature regarding SMEs and provided an overview of existing strategic management theories. The theory of DCs is preferred in this study and it is believed that it would provide the most relevant results to the analysis of this topic. The origin, definition and characteristics of the theory of DCs are discussed in the next chapter. It also provides information on how the theory is relevant to the domain of mobility and to SMEs.

Chapter 3 - Theoretical underpinning: dynamic capabilities

3.1 Introduction

The previous chapter discussed the current literature in the field of mobility, the domain of SMEs and the research field of strategic management. It concluded with the recommendations why the theory of dynamic capabilities (DCs) is well-suited for the research of mobility in SMEs. This chapter elaborates and builds on the information previously discussed on the theory of DC. It examines the origin, the definition and the requirements of the theory. It also provides recommendations on how to apply the theory to mobility, and the fluctuating environments of the SMEs.

There are three different ways theory can be used in the confines of organisational research:

- it can be the apparatus to guide, design and collect data,
- it can form an integral part in the on-going process of data collection and analysis, and
- it can be the concluding artefact of the research (Eisenhardt 1989; Walsham 1995).

In this study, the theory guided the collection of field data. However, the interview questions still left a considerable degree of openness so that the research would not be stifled through a too rigid application of the theory. The theory was also central in guiding the process of analysis.

3.2 Motivation for the choice of the theory of dynamic capabilities

The strategic information systems planning (SISP) theory and the five forces model were considered as a possible analysis framework for this study, but they were ultimately discarded in favour of the theory of DCs. These theories were discussed in section *2.5 A short discussion of strategy*.

A major concern with the traditional SISP methodologies is that they run the risk of ignoring the aspect of human behaviour and placing too much focus on the rational and formal aspects of the organisation (Lee & Pai 2003). Madan et al. (2003) suggest that companies should not indulge in the ‘design’ and ‘planning’ methods of strategic planning anymore. Instead, they should move towards what is necessary for ICT management in the current context. This is a more ‘environmental’ and ‘configuration’ approach, in which management of all levels should continually contemplate multiple perspectives regarding the discernment of value, and nurture ‘value skills’ on an on-going basis to promote uninterrupted excellence (Madan, Sorensen & Scott 2003).

Porter's seminal research created a legacy with describing the environmental conditions that encourage high levels of firm performance (Porter 1985). The five-forces model describes the characteristics of an attractive industry and insists that a firm will enjoy greater opportunities and fewer threats in such industries (Porter 2008). Porter's work has predominantly focused on analysing the firm's environment and then determining the impact on its competitive position. Yet, this type of research has mostly overlooked the influence of idiosyncratic resource attributes on an organisation's competitive position. It has made two erroneous assumptions in simplifying the analysis. Firstly, Porter assumed that firms that share an industry are identical pertaining to their strategic resources and the strategies they deploy. Secondly, Porter made a short-sighted assumption that resource heterogeneity within an industry is ultimately short lived, because strategic resources are highly mobile and will soon be distributed across the firms (Barney 1991).

Another limitation with Porter's five forces and value chain analysis is their primary concern with themes of efficiency and effectiveness, which may overlook vital resources and capabilities that could lead to competencies that differentiate one firm from the other (Duhan, Levy & Powell 2001). Porter's five forces is an astute framework about market position, but it is limited because it is bereft of any thoughtful conceptualisation of the firm itself. The five forces only differentiate companies through the product choices they make. It ascribes minimal focus on the enterprise itself or on the influences of management capabilities (Augier & Teece 2008).

One could decide to follow Porter's strategy as described earlier in the chapter. His strategy focuses on industry structure and the role of IS is described as a boon to lower cost, a rampart to construct barriers, and as a convenient need of interactions to lock in suppliers and clients. The theory of DCs on the other hand, is a more recent development in literature on strategy. This view focuses on the accumulation of resources and capabilities that are "rare, valuable, non-substitutable and difficult to imitate" (Dyer & Singh 1998:660). Both the market and many academic authors have broadcast mobility as a source of competitive advantage (Basole 2007; Basole 2005b; Coursaris et al. 2008; iPass 2012; Scornavacca & Barnes 2008; Scornavacca et al. 2006). Since IS resources are generally not considered to be rare, valuable, non-substitutable or complicated to imitate, it is intriguing to investigate the validity of mobility's stake in strategic advantage and enterprise transformation. This study focuses on the more recent approach to strategy and discusses the role of mobility as a DC in small and medium enterprises (SMEs).

It is believed that mobile applications can make a significant contribution towards improving different steps in Porter's value chain model (Scornavacca & Barnes 2008). However, the typical SME is too small to gain competitive advantage by delivering a commanding influence on the structure of their industry. This places the five-forces framework at a disadvantage as an analysis framework for SMEs. Even

though an SME might gain some advantage from IS (including mobile systems) through the collaboration with clients and suppliers, Porter's theory cannot explain why some SMEs are able to innovatively deploy IS while others in the same market settings are not (Caldeira & Ward 2003). The DCs framework on the other hand is able to conduct this type of analysis. For instance, it will focus on the context of the firm and place an emphasis on the owner-manager's attitude and experience in IS to explain the impact that this will have on the role of IS (Caldeira & Ward 2003; Mata, Fuerst & Barney 1995).

For the reasons described in section *2.5.3 An alternative approach to strategy*, DCs is chosen as the most suitable theory in the analysis of the subject matter. The origin, attributes and application of the theory will be discussed in significant detail in the rest of the chapter.

3.3 Dynamic capabilities: origin

The origin of DCs can be traced back to a number of different academic and intellectual fields, including "entrepreneurship, the behavioral theory of the firm and behavioral decision theory, organization theory, transaction cost economics, and to some extent evolutionary economics" (Augier & Teece 2008:1187). It challenges managers to apply an entrepreneurial approach to identify and seize opportunities, while also persistently renewing the corporation (Augier & Teece 2008).

The term 'dynamic capabilities' entered literature with Teece et al. (1990 in Augier & Teece 2008). At that time, the linkages with the resource-based approach was strong and it was described in the following way:

> *"If control over scarce resources is the source of economic profits, then it follows that such issues as skill acquisition and learning become fundamental strategic issues. It is in this second dimension, encompassing skill acquisition, learning, and capacity accumulation that we believe lays the greatest potential for the resource-based perspective to contribute to strategy. We will refer to this as the 'dynamic capabilities approach', recognizing of course that it is part of the overall resource-based perspective" (Teece et al. 1990 in Augier & Teece 2008:1191)*.

DCs are rooted in the work of Penrose (1959 in Augier & Teece 2007) and Schumpeter (Teece & Pisano 1994). Penrose described a business enterprise as being a product of its previous activities in acquiring and creating collections of perishable resources. These resources could be combined, reconfigured and adapted to produce a variety of different products. Unfortunately, Penrose's framework was fairly static and it could not convincingly prescribe methods for the enterprise to replicate sources of success (Augier & Teece 2007). A more robust

framework was required. This led to the development of DCs, which endeavours to explain how sustainable competitive advantage can be achieved in a fluctuating environment amidst strong opposition (Augier & Teece 2008).

> *"At the heart of the framework is an effort to define managerial traits, management systems, and organizational designs that will keep the enterprise alert to opportunities and threats, enable it to execute on new opportunities, and then constantly morph to stay on top, once it has put the systems in place, to capture the fruits of its first round of success" (Augier & Teece 2008:1190).*

The DC framework contains more depth in its description of resources and factors than what was present in the Penrose or the resource-based approach. By uniting the incongruent theories of entrepreneurship, organisational behaviour, decision theory and innovation, it is able to discover key classes of capabilities that are essential for the enterprise to generate long-term and superior profits (Augier & Teece 2008).

Schumpeter created his Theory of Economic Development in 1934. He had the view that entrepreneurs achieved economic development by wielding technological opportunities, which are apparently designed independent of the market, and fortuitously applied those opportunities in the market. The successful innovator commanded a monopoly, for the time being, while the rest of the market swarmed to imitate him. DCs focus on internal organisational processes more than Schumpeter ever conceived. It is also not only concerned with organisational change, but also prescribes orientational approaches and market analysis processes on a company level (Teece & Pisano 1994).

DCs are most closely related to the resource-based view (RBV) of the firm, which is also concerned with how competitive advantage is achieved and sustained. RBV describes the organisations to conceptually be collections of resources that are miscellaneously distributed across the firm (Eisenhardt & Martin 2000). According to these assumptions mentioned, researchers have theorised that resources that are valuable, rare, inimitable and non-substitutable will constitute to sustainable competitive advantage when deployed according to new value-creating strategies, which are difficult to duplicate by competitors (Barney 1991). The RBV, however, was not robust enough to manage in high velocity markets. In such markets, it is a strategic challenge to sustain a competitive advantage when the durability of the advantage is fundamentally volatile, and when strategies have to incorporate the passage of time and when the DCs themselves are already unstable processes with difficulties to sustain (Eisenhardt & Martin 2000). DCs have combined the central factors of RBV with durability in volatile markets to form a more rounded and stable theory.

3.4 Dynamic capabilities defined

DCs refer to the specific ability of business enterprises to shape, reshape, configure and reconfigure resources in response to fluctuating technologies and markets and to generate sustainable profits (Augier & Teece 2008). DCs are focused on generating and exploiting internal and external competencies of an enterprise-specific nature in order to sense, seize and adapt said competencies according to the demands of the company's changing environment (Teece & Pisano 1994; Teece et al. 2007). DC can be defined as:

> *"The firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change. Dynamic capabilities thus are the organizational and strategic routines by which firms achieve new resource configurations as markets emerge, collide, split, evolve, and die" (Eisenhardt & Martin 2000:1107)*.

If a firm is in possession of resources/competencies, but lacking in DCs, then it could potentially generate competitive returns for a short period, but it would not be able to sustain superior returns (Augier & Teece 2008). In the DC approach, competitive success is dependent on the unremitting development and reconfiguration of a firm's own assets (Teece & Pisano 1994; Teece et al. 2007). DC researchers focus specifically on describing the process whereby organisations develop and renew internal competencies (Augier & Teece 2008). The rapid change in markets means there is still a requirement for organisations to assimilate, build and reconfigure internal and external competencies to compete successfully (Teece et al. 2007).

Some authors suggest that DCs are defined according to high-level, strategic routines by which firms "alter their resource base – acquire and shed resources, integrate them together, and recombine them – to generate new value-creating strategies" (Eisenhardt & Martin 2000:1107; Winter 2002). On the contrary, according to Augier and Teece (2008), this neglects the influence of innovation, which is definitely not a routine activity. Accordingly, they indicate that the DC framework has a larger responsibility because it includes factors such as asset selection and asset orchestration as essential capabilities (Augier & Teece 2008). Examples of DCs are product development routines, strategic decision making, acquiring and releasing resources, and reconfiguration of resources (especially knowledge-based ones). When approached on a strategic level, DCs implicate "the routines by which managers reconnect webs of collaborations among various parts of the firm to generate new and synergistic resource combinations among businesses" (Eisenhardt & Martin 2000:1107).

Some authors have characterised DCs as being idiosyncratic and unique processes, which emerge due to the specific path histories followed by individual firms (Barney 1991; Teece et al. 2007). However, the view of Eisenhardt & Martin (2000) is more agreeable. They said that while the details of DCs are certainly idiosyncratic, it is

remarkable to observe that accomplished DCs do share commonalities with the features of other accomplished processes across industries. These common features are shared because there is generally a more right or more wrong way to execute capabilities for handling organisational, interpersonal and technical challenges. Just like there are more and less effective methods of hitting a golf ball, there are better and worse methods to utilising the theory of DCs. This is what practitioners would call 'best practice'. However, this does not suggest that any specific DC is exactly alike across firms (Eisenhardt & Martin 2000).

3.4.1 Firm resources

"Firm resources include all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney 1991:101). A resource can also be a tangible or intangible asset that provides input into production, which a firm owns, controls or has access to for a suitable amount of time (Helfat & Peteraf 2003). The large variety of firm resources can be classified into three categories: physical-, human- and organisational resources (Barney 1991). On the other hand, Miller & Shamsie (1996) identify two different forms of resources which they call, property-based and knowledge-based. The two forms are more applicable in different environments. Property-based resources are most advantageous in stable environments, while the knowledge-based resources are more useful in uncertain or dynamic environments. Knowledge resources are especially tough to imitate because they are subtle and a challenge to understand. "Property resources are about control, while knowledge-based ones are enablers of adaptation" (Duhan et al. 2001:25). IS resources and capabilities are susceptible to influence from its environment and it is pertinent to consider the organisational context in which assets are located (Miller & Shamsie 1996). "This reinforces the IS view that it is the use and management of IS that confer advantage, not their mere existence" (Duhan et al. 2001:25).

However, not all resources are relevant strategic capabilities. Only those resources that conceive and enable the implementation of strategies that improve the efficiency and effectiveness of the firm are considered to be DCs (Barney 1991). To consider the usefulness of DCs, it is necessary to explore their attributes and characteristics. A resource must exhibit all of the attributes to lead to competitive advantage (Wade & Hulland 2004). This means that resources must contain all of the qualities of value, rareness, inimitability and non-substitutability to be considered as DCs (Barney 1991).

Each of these attributes is discussed in more detail:

Valuable resources

Firm resources can only be recognised as DCs if they are valuable. Resources are valuable when they enable the implementation of strategies that are advantageous to the effectiveness and efficiency of the firm. It is essential for the strategies conceived by such resources to exploit opportunities and neutralise threats (Caldeira & Ward 2003).

With regard to IS, appropriate IS resources certainly hold value for the organisations that possess them. Many studies have proven the value that IS resources provide to the firm, even in cases when the value was not fully realised (Bharadwaj 2000; Mata et al. 1995; Ross, Beath & Goodhue 1996).

Rare resources

Valuable firm resources cannot create competitive advantage if they are simultaneously being implemented by competitors. If a number of firms possess the same valuable resources, then each of them can exploit the resource for its value, and then the resource is not rare. It thus neutralises any advantage that the resource could offer. The firms would all be able to conceive of the strategies enabled by the resource and consequently, there would be no strategic advantage over competing firms (Barney 1991). The resource must be rare among present and impending competitors of the firm for there to be any value in it (Caldeira & Ward 2003). This does not diminish the importance of valuable, yet common resources. Valuable, but common resources enable a firm to survive when they are pressured to counter with competitive parity of an industry. Competitive parity, however, will not favour any one firm by increasing its potential for economic survival (Barney 1991).

In IS, many resources cannot be commonly distinguished as being *rare*. This is because firms that lack important IS technologies, operational competence and knowledgeable IS personnel, can acquire the necessary expertise by attracting competent IS personnel with superior wages, or through business arrangements with consultancy firms (Wade & Hulland 2004). However, it is the bundles of firm resources that are necessary to perceive and implement strategies. Most strategies require a specific mixture of physical, human and organisational resources to implement it successfully (Barney 1991). Thus, IS resources should not be analysed separately or required to lead to strategies through the technology's contributions alone. IS resources should be studied in accordance with the human and organisational resources that complement them. An example of such resource, which is always required in the successful implementation of IS strategies, is managerial talent (Barney 1991; Caldeira & Ward 2003; Mata et al. 1995). Consequently, when IS/IT is combined with a complimentary bundle of resources, then it can lead to competitive and strategic advantages and accordingly be considered as a capability. At the very least, rare resources could lead to first-mover advantages for the firm (Chen et al. 2010).

Inimitable resources

Valuable and rare resources can only contribute to the competitive position of a company if the other firms that lack these resources, also cannot easily imitate or copy the resources (Barney 1991; Caldeira & Ward 2003). This type of resource has also been defined as being 'imperfectly imitable' (Barney 1986).

> *"Firm resources can be imperfectly imitable for one or a combination of three reasons: (a) the ability of a firm to obtain a resource is dependent upon unique historical conditions, (b) the link between the resources possessed by a firm and a firm's sustained competitive advantage is causally ambiguous, or (c) the resource generating a firm's competitive advantage is socially complex" (Barney 1991:107).*

Unique historical conditions – It is erroneous to argue that firm performance can be understood independently from their histories and other idiosyncratic attributes. The resource-based model clearly states that firms are essentially historical and social entities that depend on their position in time and space to obtain and capitalise on certain entities. Once the specific time (opportunity) in history has passed, then the firm that did not seize the opportunity cannot obtain those resources again (Barney 1991). Accordingly, the history of a firm can prevent competitors from imitating or acquiring its resources and capabilities, since many such attributes advanced gradually over a considerable period of time in the unique history of an organisation (Daniel & Wilson 2003).

Causal ambiguity – Causal ambiguity exists when the contribution of a specific resource to the competitive advantage of a firm is not understood or is imperfectly understood by competitors (Caldeira & Ward 2003). When this link is poorly understood, then competitors find it difficult to duplicate the strategies by imitating its resource configuration, or even to know which resources are responsible (Barney 1991). Ambiguity may exist because the competitive advantage hinges on tacit characteristics in the firm or it is comprised of "a large number of small decisions and actions, rather than a few large [imitable] ones" (Daniel & Wilson 2003; Mata et al. 1995:493).

Social complexity – Imperfectly imitable resources cannot be systematically imitated even with carefully managed processes, because they are very complex social phenomena (Caldeira & Ward 2003). Socially complex resources significantly constrain the ability of other firms to imitate them (Barney 1991). Such resources depend on the combined action of many individual entities, such as company values or reputation among clients and suppliers (Daniel & Wilson 2003).

IS systems that are socially complex are the most difficult to imitate. In contrast,

companies are usually able to imitate IT technologies and develop technology skills by hiring the necessary expertise through the labour markets, or through cooperating with external consultancy firms. It is much rarer, but it is still possible to imitate IS management and cost efficiency capabilities by the same methods (Wade & Hulland 2004).

Non-substitutability

The final requirement of a DC is that there should not be any equivalent valuable resources that are commonly available as substitutes (Caldeira & Ward 2003). Two resources are strategically equivalent when each separately enables the implementation of the same strategies (Wade & Hulland 2004). If a firm strategically exploits a valuable, rare and imperfectly imitable resource, it will achieve competitive advantage if there are not any strategically equivalent resources. However, if there are substitute resources that are strategically equivalent, then competitors can exploit them and achieve the same strategies, many different firms will be capable of deploying the same strategies, and those strategies will not be the source of a competitive advantage anymore (Barney 1991).

3.4.2 The definition of dynamic and capability

A capability is the firm's ability to utilise resources to execute a coordinated set of tasks to achieve a desired result (Helfat & Peteraf 2003). "Capabilities reflect the ability of firms to combine resources in ways that promote superior performance" (Bharadwaj et al. 1999:378). Capabilities have the capacity to turn inputs into outputs and they "can include skills such as technical or managerial ability, or processes, such as systems development or integration" (Wade & Hulland 2004:109).

A capability that can evolve and change over time is referred to as being 'dynamic' (Helfat & Peteraf 2003). Capabilities that involve a repetitive pattern of routine tasks, such as the manufacturing of products, may be referred to as being 'operational' or 'organisational' (Helfat & Peteraf 2003; Winter 2002). But, DCs are not operational in nature, nor do they involve the production of goods or services (Teece et al. 2007). Rather, as mentioned before, DCs shape, reshape, configure and reconfigure *operational* capabilities. Their contribution on the output of the firm is indirect, rather than direct [like mobility], by influencing the operational capabilities (Helfat & Peteraf 2003). Instead DCs "will change the product, the production process, or scale or the customers (markets)" (Winter 2002:3), and DCs orchestrate the progression of change in ordinary capabilities (Collis 1994).

3.4.3 Sustained competitive advantage

Sustained competitive advantage is a major topic of research in strategic management (Porter 1985; Ward & Griffiths 1998). Most research regarding sustained competitive advantage has concentrated on identifying a firm's opportunities and threats or exploiting strengths and neutralising weaknesses both internal and external to the organisation (Barney 1991; Porter 1985; Porter 2008). Competitive advantage is also a central topic to DCs and the RBV, although researchers do not all agree about its attainability, and consequently, it is worth discussing. It is believed that sustained competitive advantage can be achieved by modifying the resource base to produce, integrate, recombine and discharge resources (Eisenhardt & Martin 2000). However, whether this advantage can be sustained is a point of contention between even the seminal authors (Winter 2002).

Much of the mystery and confusion regarding DCs is because the theory is too tightly linked to philosophies and formulas, which promote generalised effectiveness and sustainable competitive advantage (Winter 2002). It is a mis-identification to say that DCs are a source of sustainable competitive advantage, as some authors like to declare (Barney 1991; Teece et al. 2007; Dyer & Singh 1998). As noted earlier, DCs have common features and key commonalities, which are shared across firms. Thus, it is a violation to assume that DCs or the RBV, have consistent heterogeneity across firms. This means that firms with superior DCs might achieve competitive advantage over firms with lesser capabilities, but the DCs are not in themselves the sources of competitive advantage (Eisenhardt & Martin 2000). It is obvious from previous experience that applying the strategy of DCs could lead to sustained competitive advantage, but promoting it as uniform tool that can achieve this every time, is inevitably flawed. There is just no way that it could counter every contingency, but, as a tool for strategic analysis, the concept of DCs is highly helpful (Winter 2002). Drnevich and Kriauciunas (2011) discovered that DCs do not inevitably increase company performance, but their influence on performance does increase in environments that are dynamic.

The most pragmatic and agreeable approach, as suggested by Eisenhardt & Martin (2000), is that in reality competitive advantage is often short term. Thus, to compete, it is proposed that managers should plan for, and aim at, achieving a series of temporary advantages. The potential for competitive advantage lies in applying DCs earlier, more shrewdly, or more fortuitously than competitors to create advantages in resource configurations (Eisenhardt & Martin 2000).

3.4.4 Critique

There are many strategy researchers who remain sceptical about the value and contribution of DCs (Winter 2002).

The theory has been criticised for being conceptually ambivalent and tautological, by not clearly defining the method by which resources essentially contribute to competitive advantage. Its apparent lack of empirical grounding has also been challenged (Eisenhardt & Martin 2000; Priem & Butler 2001). However, this criticism is refuted because of the following reasons:

Firstly, DCs are neither ambivalent nor tautological. They "consist of specific strategic and organizational processes like product development, alliancing, and strategic decision making that create value for firms within dynamic markets by manipulating resources into new value-creating strategies" (Eisenhardt & Martin 2000:1106). Secondly, in contrast to the belief that DCs lack empirical grounding, they consist of specific and identifiable routines or processes and there is abundant empirical research on the theory itself, completely outside of RBV. Eisenhardt and Martin (2000) remark that if the DC theory is considered alongside its parent theory of RBV, then there exists even more empirical research and management applicability. However, RBV and DCs remain mostly unexplored in the context of SMEs, especially in the area of strategic planning (Duhan et al. 2001). This is a weakness to the theory and this dissertation will be one of the first studies to extend the framework by providing empirical analysis for DCs in the context of SMEs and mobility respectively.

Another criticism is that maintaining the strategic management process of DCs is an expensive endeavour, and that ad hoc problem solving is a much cheaper expenditure for an SME (Winter 2002). But, for the purpose of this study, this is not a drawback because the strategic management processes are not the issue. Rather, this dissertation will focus on using DC as an exploratory, analysis type theory. "The concept of dynamic capability is a helpful addition to the tool kit of strategic analysis …[which] remains a matter of understanding how the idiosyncratic attributes of the individual firm affects its prospects in a particular competitive context" (Winter 2002:8).

Even though the RBV had fewer leniencies, the DC framework still has a low tolerance for resource complementarity. This is a little crippling when analysing IS resources, because they mostly perform in conjunction with other resources to promote performance. IS performs a complex role in the firm and always acts interdependently with other resources, but the exact nature of its role is still largely unknown. Both the RBV and DCs have recognised this role, but neither has made much progress to address it sufficiently (Wade & Hulland 2004). The fact that not many other formal strategic theories have made a more significant analytic impact in this area, justifies that the DC framework is still a valid theory to use in this research study (Lederer & Salmela 1996; Porter 2008; Porter & Millar 1985).

3.5 Applying dynamic capabilities in IS

The distinction between resources and capabilities is that "capabilities reflect the ability of firms to combine resources in ways that promote superior performance" (Bharadwaj et al. 1999).

> *"IT competencies are defined as a firm's knowledge, skill, and experience, while IT capabilities are defined as the ability of the firm to perform a particular task or activity using IT resources (tangible and intangible)" (Bullon 2009:89).*

The RBV is growing in popularity amongst IS researchers and it provides an intriguing platform for contribution to the field. "The theory provides a valuable way for IS researchers to think about how information systems relate to firm strategy and performance. In particular, the theory provides a cogent framework to evaluate the strategic value of information systems resources" (Wade & Hulland 2004:109).

Some authors' insistence that DCs should result in sustained competitive advantage, is not in congruence with the nature of IS, which rarely contribute directly to sustained competitive advantage. IS usually influences the firm through a complementary relationship with its resources. Resource complementarity, although recognised, is not well-developed in either RBV or in DCs. When considering the role of IS in the firm, the theory would enhance its applicability if this area was more refined (Wade & Hulland 2004).

Wade and Hulland (2004) propose a fifth attribute, which will be applicable to IS resources in addition to rarity, value, inimitability and non-substitutability. They named it 'imperfect mobility'. This resource is focused on the rate of transferability of an IS resource between firms. IS infrastructure, for example, is highly mobile because once it is launched, it is easily disseminated by other firms. Capabilities such as technology skills, IS development, cost-efficiency and IS planning/management all tend to be more mobile due to their accessibility through the marketplace. In contrast, the mobility of capabilities like external relationships management, IS business partnerships and market responsiveness tend to be much lower (Wade & Hulland 2004).

3.5.1 Resource categorisation

To assist the analysis of mobility resources and capabilities in SMEs, it is useful to consider the findings of previous IS researchers. Numerous authors have done empirical research to define IS capabilities. Some of the most relevant findings were published by Bharadwaj et al. (1999:379), who empirically validated that IT capabilities could be divided into five dimensions:

- "IT business partnerships,

- external IT linkages,
- business IT strategic thinking,
- IT business process integration,
- IT management, and
- IT infrastructure".

Mata et al. (1995) investigated the relationship between IS resources and firm performance by utilising resource-based arguments to propose that the following five vital IS capabilities lead to sustained competitive advantage:

- customer switching costs,
- access to capital,
- proprietary technology,
- technical IT skills, and
- managerial IT skills.

It is interesting, however, that Mata et al. only found empirical support to validate the capability of 'managerial IT skills'. Powell & Dent-Micallef (1997) defined three categories for the division of IS resources: human resources, business resources and technology resources. It is intriguing that they found that only human resources in combination with IT, contributed to firm performance. In the business resource category, only IT training made a positive contribution to performance, while no technology resource had a direct effect.

Some of the literature divided IS resources into two broad categories that can be described as IS assets (technology-based) and IS capabilities (system-based). IS assets, such as infrastructure, are simple to copy by competitors and consequently, they form a fragile source of performance advantage. In contrast, there is substantial evidence that the superior deployment of IS capabilities can cause competitive advantage (Wade & Hulland 2004). Similarly, it will be easy for competitors to copy mobile ICTs present in their industry, but mobile capabilities is where the advantage lies.

3.5.2 Application in analysing mobility

At first consideration it seems unlikely for mobility to be considered as a DC. It is a commodity and certainly not valuable, rare, inimitable or non-substitutionable. But, any asset available for purchase would not meet that description, especially any IT asset. The asset by itself does not constitute the capability (Eisenhardt & Martin 2000). Any firm resources can be copied or replicated by competitors rather effortlessly. A capability on the other hand, is difficult to replicate because it is closely intertwined with the previous experience, organisational culture and history of a firm

(Bharadwaj et al. 1999). That is why this study does not focus on mobile computing technologies, but rather on the capabilities that utilise them.

Eisenhardt & Martin (2000) highlight that the functionalities of any DCs could be duplicated throughout a market, thus, the value of a resource is found in the configurations they create and not in the capabilities themselves. Wade & Hulland (2004) declared that DCs provide an interesting platform to determine the strategic value of IS resources. That is exactly how this study explores the subject matter. It analyses and investigates the information system of mobile ICT for the existence of certain enabling resources, which can be considered as being DCs. It also determines the influence these resources have on performance. Of particular interest to mobility is to identify capabilities amongst the processes and configurations. This would imply that the processes, which are in support of, or initiated by mobility, could be analysed according to the theory. The DCs theory is used in this study for its analysis and exploratory strengths. It provides a convenient method for IS researchers to investigate the role of IS within the organisation (Wade & Hulland 2004). Consequently, its application to mobility is valuable.

When DCs have been used to explore and define the influence of IS resources (specifically mobility) on the firm, then it can be compared on equal footing to other firm resources. Eventually, their role can be integrated into an understanding of long-term firm competitiveness (Wade & Hulland 2004). There has not been any application of the concept of DCs in the domain of mobility and accordingly, this dissertation aims to gain ground on extending the theory to practice in this domain. It can be argued that DCs are in favour of mobility because of how quickly the technology and market demands change. It is a dynamic domain and formal mobile strategies are only viable for a matter of months. That is why, if one can identify the capabilities, then these can be divided into separate responsibilities to be continually recreated and thus, sustain a competitive advantage.

A matter that is important for the analysis of mobility with DCs is ‘resource specificity’. Specifically in the domain of mobility, the usefulness in DC analysis will be dependent on how broadly or narrowly the resource is defined. How finely a researcher describes the resource under investigation will affect both his results and the approval of readers (Wade & Hulland 2004). Because of the attributes of mobile technologies, the topic of this dissertation will be more generalised and inclusive to embrace the processes and transformations that were both created for an enabled mobility to make the SME fully mobile. The impact on sustained performance for this analysis will then be further investigated for each SME. The researcher has heeded the warning of Wade & Hulland (2004) that a broad definition may lead to the uncovering of capabilities that are not truly related to mobility, and therefore, serious attempts were made to only present the results with strong mobile relationships.

3.6 Dynamic capabilities and SMEs

"There is much in the resource-based view that is intuitively appealing for understanding SMEs' use of IS" (Duhan et al. 2001:26). The DC framework is well-suited to the study of SMEs because of the critical role that entrepreneurial management plays in the framework. Entrepreneurial management does not refer to an individual entrepreneur/manager, instead, it refers to the managerial style of the management team and it recommends that the management style should be related to the 'entrepreneurial function' (Augier & Teece 2008). The entrepreneurial function must set coherent goals, assist in gauging opportunities, set culture, encourage trust and lead strategic decision making (Augier & Teece 2008). There is a significant overlap between the role of the manager and the entrepreneur as described by Simon (1991:31):

> *"Especially in the case of new or expanding firms, the entrepreneur does not face an abstract capital market. He or she exerts much effort to induce potential investors to share the company's views (often optimistic) about its prospects. This executive is much closer to Schumpeter's entrepreneur than to the entrepreneur of current neoclassical theory. Whether the firm expands or contracts, is determined not just by how its customers respond to it, but by how insightful, sanguine and energetic its owners and managers are about its opportunities."*

Bharati & Chaudhury (2012) determined that the greatest driving forces behind technology integration concerning SMEs are competitors and professional networks. By competitors, they refer to those companies that are in a similar line of business and that employ people from similar experience and background. Their study determined that SMEs are all very aware of the actions of competitors and once an SME adopts a new technology, professional networks efficiently disseminate the knowledge and ensure assimilation throughout the particular industry (Bharati & Chaudhury 2012).

3.7 Concluding summary

The theory of DC is an involved and intriguing framework for analysing strategic intentions and transformations through capabilities. This study will make strides towards expanding the theory to include the DCs of a commodity technology such as mobile ICT. However, as discussed in this chapter, it will not be the technologies that are capable of developing capabilities, but rather it will be the bundles of resources that will include mobile technologies, business aptitudes, organisational structures and human resources. It is the use and management of IS that confer advantage, not their mere existence (Duhan et al. 2001:25). This is exactly why mobility can be

analysed with the DC framework. To identify DCs, the study thoroughly investigates management and the use of mobility in each firm.

This chapter provided an in-depth description of the underpinning theory. It discussed the origin and mechanics of the theory, as well as how it should be applied in IS and SME studies. The next chapter, chapter 4, discusses the research design and methods that are adhered to in this study. It also provides specific information about the measures taken to ensure the validity and reliability of the data. Step-by-step instructions are provided to discuss the process of data analysis used in the study.

Chapter 4 - Research methodology

4.1 Introduction

The previous chapter discussed a description of the underpinning theory in depth. It provided the origin and mechanics of the theory, as well as how it should be applied in IS and SME studies. The method in which the underpinning theory is used to collect and analyse the data is explained in this chapter.

This chapter describes the best approach when gathering information and how to go about to analyse data for the creation of useful knowledge for the managers of SMEs. It starts with a description of the research design employed in this study and the identification methods used when selecting research participants. In the following section it discusses the research methodology with specific mention of the research instruments, the data and the analysis techniques used. Next, it discusses the relevant limitations and ethical considerations. The chapter concludes with a short summary.

Various authors have different approaches when it comes to research practices. Research in the information systems discipline is an assortment of hard and soft sciences, which created some friction around what are acceptable research practices or not. For the purposes of this research study, the researcher applied what he considers to be the most appropriate research method for the problem at hand.

The study originated because it is proposed by most trade publications and some academic authors that mobility will provide strategic and competitive advantages (Basole 2004; Basole 2007; BlackBerry 2010; Frost & Sullivan 2007; Forrester Research 2009; iPass 2012; LammTech 2008; Sheng et al. 2005). However, very few researchers have taken on the task of discovering how mobility is actually being used and whether or not its usage provides any significant strategic or competitive benefits to the firms that use it. It is interesting to examine, through the explorative use of a theoretical underpinning, whether a commodity like technology, with virtuous capabilities, can give a smaller company the competitive edge it needs. The purpose of this study is to guide decision making and to support managers in leading the transformation of their companies into the domain of mobility. Two main objectives drove the study. Firstly, the study identifies the DCs that are necessary for mobile transformation in SMEs in varied industries. Secondly, it endeavoures to recognise common practices required for developing and sustaining these capabilities effectively, also referred to as ‘best practice’.

4.2 Fundamental assumptions

4.2.1 Research paradigms overview

The development of empirical research in IS has experienced its fair share of controversy and the debate has still not been resolved regarding the merits of interpretivist, positivist or critical philosophies (Orlikowski & Baroudi 1991). All three paradigms make valuable contributions to the study of information systems.

Positivism

With regard to epistemology, positivism believes that scientific knowledge consists of facts and values, which can be distinctly defined apart from their environment (Walsham 1995). Ontologically speaking, it has transferred its research approach in the natural sciences over to the social sciences and consequently, assumes that reality is objective and a given (Myers 1997).

Interpretivism

The ontology of interpretivism allows for each person to construct their own reality. It is defined by Walsham (1995a) as: "Reality-for-us is an inter-subjective construction of shared human cognitive apparatus". The IS researcher enters into a complicated anthropological society when he enters the workplace and it is necessary to make an intelligible summation of the complex environment involving information systems, managers, users and designers. Walsham (1995a:80) is in favour of this paradigm when he argues that:

> *"… there is a need for much more work from an interpretive stance in the future, since human interpretations concerning computer-based information systems are of central importance to the practice of IS, and thus to the investigations carried out by IS researchers."*

Critical research

Critical research is an important emerging paradigm in information system research which aims at achieving transformation over alienating and restrictive social conditions, inequalities and conflicts (Myers & Klein 2011; Orlikowski & Baroudi 1991). Although critical research agrees with the ontology of interpretivism that reality is socially constructed, it does not focus on interpretation but rather provides a social critique of a current phenomenon and should be classified as a distinct research philosophy (Hirschheim & Klein 1989; Myers 2010; Myers & Klein 2011; Orlikowski & Baroudi 1991). In IS research, it focuses on power struggles and conflicting or contradicting situations, and aims to stir people to rise up and overthrow the sources of alienation and domination (Oates 2006). "Critical research in information systems is concerned with social issues such as freedom, power,

social control, and values with respect to the development, use, and impact of information technology" (Myers & Klein 2011:17).

4.2.1 Preferred paradigm

The philosophical paradigm followed in this dissertation is interpretivism. "Interpretive methods of research start from the position that our knowledge of reality, including the domain of human action, is a social construction by human actors" (Walsham 2006:320). Other paradigms such as positivism or critical methodologies are not completely objectionable, yet it was decided that they would not be the most suited to gain the results required for this dissertation.

It was expected that most of the SMEs would not have a formal strategising process and that their investments in mobility will instead be emergent, tacit and 'accidental' (Gottschalk 1999; Ward & Griffiths 1998; Quinn et al. 1988). It was therefore necessary to attempt to discover the implicit strategic activities behind the companies' mobile successes. This is a challenge and only the interpretivist paradigm is capable of discovering tacit knowledge and hidden meanings behind the data collected from the SMEs (Oates 2006). The underpinning theory of dynamic capabilities complements the philosophy of interpretivism by digging deeper into the tacit behaviours of each subject and attempting to discover what sets them apart.

4.3 Research strategy

4.3.1 Overview of case study research

The social aspects of information systems are increasingly being recognised to occupy a major component of research in its field. Many researchers have chosen to conduct their empirical studies with a particular focus on human interpretations and meanings. Such 'interpretive' investigations are often conducted through case studies (Walsham 1995a). Case study research is a valuable method when it is necessary to provide detailed information on a particular subject (Hofstee 2006). It can also be "one of the most challenging of all social science endeavours" (Yin 2014:3).

Case study research is particularly appropriate for problems in research and theory if they are still at the initial and developmental stages. The case study research strategy is also well-suited for collecting information from practitioners (Benbasat et al. 1987). Case study research enables the researcher to investigate a phenomenon in a setting over which he does not exercise any control. In other words, it refers to the study of a contemporary phenomenon in a real-life context. The major objective

in case study research is to accumulate data about genuine, contemporary phenomena in human events and behaviour (Yin 2009; Yin 2014).

It is also decidedly preferred for case studies to incorporate theoretical development as part of the design phase (Yin 2014). Accordingly, the theory of DCs (as discussed in chapter 3) formed a pivotal part of the design process.

4.3.2 Reasons for preferring case study research

Reliable information about strategic mobile ICT usage is still sparsely resourced. Although some academic research exists on the topic, it is much more prevalent in mainstream articles. The connection between mobile ICT and strategy in small businesses has not been empirically investigated under the guidance of a strategic theory such as the theory of dynamic capabilities. This led to the researcher's choice of case study research for the specific research problem. As mentioned before, it is helpful in gathering knowledge from practitioners and well-suited to problems when research and theory are still in its infancy. It is also well-suited to problems of strategic nature. Benbasat et al. (1987:383) stated it as follows:

> *"Case studies can provide the organisational context for the study of the relationship between strategy and information technology."*

Case study research was also chosen because it provides a good method for studying information systems in its natural setting. Secondly, case study research provides the researcher with a means of answering 'how' or 'why' questions (Yin 2014). The 'how' question is specific to the main research question of this dissertation. It also aims to examine the complexities and the processes that might be involved. Thirdly, it is well-suited to research of an exploratory nature (Benbasat et al. 1987; Yin 2014). Lastly, case study research is very favourable towards studies using DCs as its underpinning theory because with such an approach it is possible to sketch a comprehensive picture of the company studied, which enables exploration into their unique context and peculiarities (Daniel & Wilson 2003).

The proposed research strategy for this dissertation places value on conducting a case study which covers multiple cases and then derives a single set of 'cross case' conclusions, as opposed to investigating only an isolated case (Yin 2014). Accordingly, this approach is called: a sector case study. This means that the dissertation will not focus on a single specific case, but it will study a variety of cases that all have similar qualities and can be classified according to a shared sector. In this instance, the sector was small and medium enterprises (SME), which is employing mobility in interesting ways. The purpose of every case study was to elicit information from each company about their mobile practices and procedures, which have enabled them to transform or enjoy success in their industries.

Although it is not the most common approach, it is possible to study multiple cases in case study research and thus the researcher will "look for similarities or differences between the different cases" (Oates 2006:144; Yin 2014). The decision to use multiple cases instead of a single case was based on the fact that the multiple cases approach is more desirable when the purpose of the research is based on description, theory building or theory testing (Benbasat et al. 1987). In this case, the purpose of this study is based on the description of a phenomenon. The intention is to analyse and describe the strategic methods in which mobile ICT is utilised by SMEs, according to the theory of dynamic capabilities. The researcher reasons that because the subject matter is such an elusive concept, it is necessary to study multiple cases to try to make sense of it. Variety will be more important for the purpose of this study. Multiple cases will also make compelling evidence if the results correspond to validate a single outcome and the reader might appreciate this more than conclusions drawn from a single case (Oates 2006).

Similar research in the domain of SMEs is rare. Consequently, this study is more exploratory in nature. Exploratory research is "an approach to qualitative research where the primary motivation is to discover and explore new phenomena" (Myers 2010:258). Case studies are well-suited for the exploratory approach in research. They can draw attention to relevant features, factors, or issues that would not have been evident in other similar studies. An exploratory method in case study research complements the decision to use multiple cases because it is concerned with understanding the complexities of the real world within its context (Myers 2010).

Interpretivism is a philosophy that aids the exploration of a phenomenon (Myers 2010). Therefore, as the case studies are exploratory in nature, because not much is documented regarding mobile transformation in South African SMEs, interpretivism is a well-suited research method (Oates 2006).

However, some authors have argued that positivism is the only agreeable approach to do case studies research. For example, Walsham (1995a) states that some researchers believe that only positivist research can acceptably answer the 'how?' and 'why?' questions. Benbasat et al. (1987) urges case study researchers to ensure that their research objectives and methods are more explicitly and less unambiguously expressed, as they tend to be in positivist research studies. However, in both cases, Walsham (1995a) proves that exactly the same is expected of interpretivist researchers and consequently, those are not convincingly strong arguments in favour of positivist over interpretivist case studies. It is unfortunate that case study researchers sometimes practice sloppy procedures or present equivocal evidence which has a negative influence on the rigour of the study's findings and conclusions (Yin 2014). Such irresponsible research techniques should be avoided by following specific methodological procedures as provided by reputable sources such as Myers (2010) and Yin (2014).

4.3.3 Research cases

Data was gathered from ten separate companies, each of which can be classified as an SME according to the South African Department of Trade and Industry. The classification is shown in Table 3. Each company was selected because they have been using mobile technologies for an extended period. The researcher specifically attempted to identify companies who have a mature and interesting approach to mobility, which might set them apart from the competition. The researcher also had a particular interest in SMEs that have distinguished themselves in their field by using mobile ICT.

Table 3: Threshold for the classification for micro, very small, small and medium enterprises
(Department of Trade and Industry: South Africa 2008:3)

Sector or sub-sectors in accordance with the Standard Industrial Classification (SIC)	Site or Class	Total full-time equivalent of paid employees (Less than)	Total annual turnover (Rm) (Less than)	Total gross asset value (fixed property excluded) (Rm) (Less than)
Agriculture	Medium Small Very small Micro	100 50 10 5	5.00 3.00 0.50 0.20	5.00 3.00 0.50 0.10
Mining and Quarrying	Medium Small Very small Micro	200 50 20 5	39.00 10.00 4.00 0.20	23.00 6.00 2.00 0.10
Manufacturing	Medium Small Very small Micro	200 50 20 5	51.00 13.00 52.00 0.20	19.00 5.00 2.00 0.10
Electricity, Gas and Water	Medium Small Very small Micro	200 50 20 5	51.00 13.00 5.10 0.20	19.00 5.00 1.90 0.10
Construction	Medium Small Very small Micro	200 50 20 5	26.00 6.00 3.00 0.20	5.00 1.00 0.50 0.10
Retail and Motor Trade and Repair Services	Medium Small Very small Micro	200 50 20 5	39.00 19.00 4.00 0.20	6.00 3.00 0.60 0.10
Wholesale Trade, Commercial Agents and Allied services	Medium Small Very small Micro	200 50 20 5	64.00 32.00 6.00 0.20	10.00 5.00 0.60 0.10
Catering, Accommodation and Other Trade	Medium Small Very small Micro	200 50 20 5	13.00 6.00 5.10 0.20	3.00 1.00 1.90 0.10
Transport, Storage and Communications	Medium Small Very small	200 50 20	26.00 13.00 3.00	6.00 3.00 0.60

	Micro	5	0.20	0.10
Finance and Business Services	Medium Small Very small Micro	200 50 20 5	26.00 13.00 3.00 0.20	5.00 3.00 0.50 0.10
Community, Social and Personal Services	Medium Small Very small Micro	200 50 20 5	13.00 6.00 1.00 0.20	6.00 3.00 0.60 0.10

4.4 Data generation method

4.4.1 Qualitative interview

Qualitative research methods were used for the accumulation and the analysis of data. Even though the qualitative interview is a popular method of research, it does provide some challenges to the quality and integrity of the research product (Myers 2010). These challenges and the methods used to avoid them will be discussed later in this chapter. Regardless, qualitative interviews are still an effective research method when the aim is to discover new information. Rubin and Rubin (2005 in Myers & Newman 2007:2-3) said that “qualitative interviews are like night goggles, ‘permitting us to see that which is not ordinarily on view and examine that which is looked at but seldom seen’”.

4.4.2 Reasons for preferring qualitative interviews

Information systems involve the cooperation between social and technical systems. Qualitative research is a technique that gathers data from people and consequently, it is an appropriate technique to employ in this interpretive study. Interviews are the most common data gathering technique used by qualitative researchers, particularly when it comes to interpretive case studies (Walsham 1995a). Myers (2010:121) states that “interviews allow us to gather rich data from people in various roles and situations”. Since the context of both SMEs and information systems are largely social, the qualitative interview is a valuable research instrument to use. Myers & Newman (2007:16) have appropriately convinced the researcher to “conduct research with real people in real organisations”. Interviews are unique in this respect because they enable the researcher unparalleled access to the interpretations that participants have about their own environments, actions and the events that take place (Walsham 1995a).

4.4.3 Conducting qualitative interviews in the study

Qualitative interviews can be a powerful tool for generating conclusive research results, but it does hold some serious pitfalls, which should be avoided (Myers 2010). “What we call our data are really our own constructions of other people’s constructions of what they and their compatriots are up to” (Geertz 1973 in Walsham 2006:320). This can pose a big problem in judging the reliability of the data. The guidelines, developed by Myers & Newman (2007), have been very useful to promote the reliability and consistency of the data gathered for this dissertation.

Myers & Newman (2007) have done important work to change the method in which qualitative interviews are conducted. They named the new method of interviewing the *dramaturgical model*. In this model, the qualitative interview is approached as a drama. In this drama, there are actors, a stage, a performance, a script and guidelines for both the entry and the exit of the interview. However, one has to be cautious not to use these guidelines as a strict checklist, but to treat them only as guidelines to *guide* the conduct of a successful interview. Some of the appropriate sections of the dramaturgical model by Myers and Newman (2007) is described below:

1. **The drama** - Firstly, the interview should be viewed as a drama with all its connotations as mentioned before. The impression the interviewer (the actor) has on the interviewee is of crucial importance. Accordingly, the interviewer should display appropriate empathy, understanding, appreciation and respect towards the interviewee. The interviewer should also act like a stage director and steer the interview. Other recommendations of the dramaturgical model are also important: prevent fear of embarrassment and exploitation on the part of the interviewee and overcome the fear of silence in both the disposition of the interviewee and the interviewer.

2. **The stage** - The setting of the stage involves locating the interviewees and agreeing to a comfortable place and time for the interview. It is also important to manage the expectations of the interviewee so that he will attend the interview mentally prepared.

3. **The actors** - The actors are both the researcher and the interviewee. The researcher plays the role of the interested interviewer and the interviewee acts out the role of the knowledgeable person in the organisation. It is important for the interviewee to take the research seriously. The researcher can help achieve this by dressing appropriately and to ensure that he has sufficient knowledge about the company beforehand.

4. **The audience** - The audience can be seen as both the interviewer and the interviewee as the interview goes back and forth. But, more broadly speaking,

the audience is defined as the community of academics who will read this dissertation

5. **Script** - For this research, the script was the semi-structured interview questions that were prepared in advance to guide each interview. The researcher endeavoured to entice each interviewee into discussing their business, while still guiding the conversation in such a manner that all the prepared questions were covered. The researcher was careful not to over-prepare the script because it is always good practice for the qualitative interviewer to use an incomplete script. The art of interviewing should be approached with openness, flexibility and improvisation. The interviewer should be open to investigating interesting avenues of information, yet also delicately aware of the participants' differing attitudes.

6. **The performance** - All the factors mentioned before, together with first and last impression management, converge together to produce either a good or a bad performance. The quality of the performance affects the quality of the information received. It is important to realise that during an interview the interviewees become creative interpreters of their worlds. Accordingly, an interview draws attention to the subject's world and it is disclosed in their language. "The role of the interviewer is to be listening, prompting, encouraging and directing" (Myers & Newman 2007:15). As a whole, the more comfortable the participant is, the more open and interesting the disclosure will be, which in turn will improve the quality of the data collected. It is important for the researcher to minimise social dissonance and to be flexible with the script and the moods and attitudes of the participants.

   The appearance of the interviewer, his professionalism and his knowledge of the subject matter can affect the way that he is perceived by the interviewee and consequently affect the richness of the data (Walsham 1995a). Accordingly, the researcher was always dressed appropriately and prepared for each interview by knowing both the subject matter and having sufficient background information about the interviewee's company.

As previously mentioned, the interviews were semi-structured. This allowed the participants to elaborate on perspectives far beyond that which would have been possible in the restrictions of structured questionnaires or surveys (Caldeira & Ward 2003). The interview questions were carefully formulated to probe 'behind the scenes' of the entrepreneurial decision making. It consisted of sufficient probing questions to try and discover or piece together the organisational transformations mobile ICT was specifically responsible for. Both the theory and the literature review were used to formulate the questions. The interview questions were shared with an experienced business manager before the interviews started to make sure that each

question was understandable and appropriate. The interview questions can be perused in Annexure A.

The interview questions were divided into six different sections. The first section gathered information about the SME, its background, the types of mobile technologies used, and any benefits or transformations it might derive from these technologies. The second section explored the actual mobility of the company by delving into the way in which it uses its mobile technologies. This included business practices, training and communication. The third section attempted to discover whether there is any permanency in technology utilisation, which might distinguish the company from other competitors. The fourth section explored the relationships that are formed and maintained through mobility. This included the influence that mobility might have on the competitors of the company. The fifth section investigated the internal social system of the company and the methods the company uses to react to the mobile environment. Finally, the questions concluded by inquiring about mobile management (including the technologies and the mobile employees) and any future interests or headaches the SME might have regarding mobility.

4.4.4 Research protocol

Prospective SMEs were identified through informal conversations with a variety of businesspeople during which the researcher explained what he required from a company and then noting which companies were suggested. Other SMEs were identified by scouring the Internet for prospective candidates who possess one or more of the desired qualities. The sought-after qualities met those that define an SME according to the stipulations mentioned, but they also included: a) a company with a substantial history of mobile ICT usage, b) the unique utilisation of mobile ICT in a remarkable way, or c) mobile companies that displayed longevity and success. Each prospective candidate received a personal phone call from the researcher. During the call, the researcher inquired a little more about the company, explained the research and requested an interview with a knowledgeable employee. Many companies were approached in this manner and ten of them agreed to an interview. The majority of the interviews were conducted face-to-face, but two interviews were conducted via videoconferencing due to travel restrictions. The locations of eight of the ten interviews were conducted at the respective offices of the interviewees to ensure familiarity, convenience and their comfort. Two interviews, those with company I and J, were conducted via videoconferencing, however, the content received in those two interviews did not seem to be deficient in any way, when compared to the other eight, either in terms of volume or quality. Initial informal conversation also helped to make the interviewees more comfortable and relaxed before the interviews started.

At the start of each interview, the researcher introduced himself and explained the general content and objectives of the research study to the participants. He then gave a letter of permission and informed consent to each participant to sign (see Annexure B for a copy of this letter). The signed letters from each participant are available on request. The researcher also told the participants that there will be some business benefit to them when they receive feedback on the results of this study. The interviews were conducted during July and August 2013.

4.4.5 Data collection instruments

All the interviews were recorded with a digital recording device, with the participants' consent. After the interviews, the recordings were transferred to the researcher's computer and also backed up in a cloud storage service to ensure permanent storage. All the interviews were transcribed to ease analysis.

Observation was not used as a data gathering technique, but the researcher carefully observed each interviewee while asking the semi-structured questions. He looked at facial and other observable signs to help him determine the correct timing for each question, as well as the relevancy of certain questions to that particular interviewee. This meant that, if a participant became uncomfortable or uncertain about a question, the researcher could expand on or rephrase the question. This technique assisted the researcher in making sure that the guidelines detailed in the dramaturgical model were met. This applied to the guidelines that insist on minimising social dissonance and increasing flexibility, in particular (Myers & Newman 2007).

Documentation for the study was sourced from scientific publications and used in conjunction with different practitioner-specific articles. Each resource was mentioned as it was used (a list of the references can be viewed under 'References' in this dissertation.) All the referenced articles and publications are stored electronically on an external storage device and are also available on request.

In addition, the researcher read all available marketing material and other information on websites about the companies before each interview to enable him to conduct the interviews with sufficient background information. This also assisted in providing a better interpretation of the worlds the participants and their companies operate in.

4.4.6 Research participants

Each participant was selected based on the size and turnover of their business. According to the industry sectors defined by the South African Department of Trade and Industry (2008), the participants came from the following industries:

- Catering, accommodation and other trade
- Transport, storage and communications
- Wholesale trade, commercial agents and allied services
- Community, social and personal services
- Construction
- Manufacturing

Table 4 contains short profiles of all the interviewees. The job title of each participant is included to add validity to the data derived from each company. It also enables the reader to draw his own conclusions, based on the 'weight' their designations may ascribe to the answers of each participant. A detailed description of the background information of each company is provided in chapter 5.

Table 4: Interviewee profiles

	Job title	Company	Industry sector
A	General manager	Estate property management	Catering, accommodation and other trade
B	Chief executive officer (CEO)	Total information technology solutions	Transport, storage and communications
C	Operations manager	Internet solutions provider (ISP)	Transport, storage and communications
D	Sales engineer	Computer-aided design software retailer	Wholesale trade, commercial agents and allied services
E	Head sound engineer	Hosting of public functions and live broadcasting on national television	Community, social and personal services
F	Sales manager	Computer-aided design software developer	Construction
G	Architect	Architecture firm	Construction
H	Managing director	Laser design, research and development industry	Manufacturing
I	Sales manager	Mobile ICT retailer	Wholesale trade, commercial agents and allied services
J	Chief executive officer (CEO)	Wholesale distributor of optical equipment	Wholesale trade, commercial agents and allied services

4.5 Data analysis

4.5.1 The data

This section provides the important opportunity to discuss the strengths and weaknesses of the data gathered during the interviews (Hofstee 2006). “What we call our data are really our own constructions of other people’s constructions of what they and their compatriots are up to” (Geertz 1973:9). “Interpretive researchers are attempting the difficult task of accessing other people’s interpretations filtering them through their own conceptual apparatus, and feeding a version of events back to others” (Walsham 1995a:77). It was of vital importance for the researcher to treat the gathered data as subjective interpretations of the realities created by the participants, as well as interpretations by the researcher himself.

The researcher tried to improve the quality of the data by maintaining a fine balance between excessive passivity and over direction during the interviews. The researcher therefore maintained a ‘non-judgemental form of listening’ throughout the interview and applied good social skills and personal sensitivity (Walsham 1995a). This allowed the interviewees to express their own views and opinions with confidence, despite the researcher’s gentle directing of the interviews to gather the required data. The data gathered with the interviews is believed to be of sufficient quality and quantity to draw reasonable conclusions. This is supported by the fact that many of the themes identified in the underpinning theory and in the literature review can be linked to themes of information and the data. This proves that there is an internal logical consistency between the generated data and previous research. Additionally, multiple sources of evidence collected from ten different interviewees converged on the same facts or findings, an effort which substantially increases the quality of case study research (Yin 2009).

Qualitative research is the main data analysis method used in exploratory research with non-numeric and rich textual data. It is also a good complement to the interpretive paradigm (Oates 2006).

4.5.2 Analysis and interpretation of data

In an attempt to increase the credibility of the study, a description of the process followed during the analysis of the interviews follows. Since this is an interpretive study, it is wise to be more vigilant in the reporting process (Walsham 1995a). The data analysis results are discussed in chapter 4.

The qualitative data analysis method used was coding. A code is a word that is used to assign units of meaning to condense or label a sentence, a paragraph or a section of text in the qualitative data. A code allocates a label to a segment of data and

classifies that segment into a specific category (Myers 2010). Four steps are followed in the coding of the interview data:

i. The material was read through the lens of the researcher's own theoretical knowledge, as well as the research questions to guide the initial interpretation of the transcripts. The purpose was to identify all the different topics that occur in every single interview. During this first step, the aim was not to identify similar topics featured across the different interviews, as the interviews were not yet considered comparatively. The aim was also not to force the text passages to fit into the researcher's own interpretations or his underpinning theory. Analytical categories that were true to the context of each interview were formulated (Schmidt 2004).
ii. The analytical categories were assembled into a guide for coding. This entailed formulating detailed descriptions of the individual categories. The different passages in the transcripts were then placed into the categories in which they fit best (Schmidt 2004).
iii. The interviews were repeatedly read in reference to comparisons between specific questions (Schmidt 2004). The interviews were physically marked with a classification according to the categories in the coding guide (Myers 2010). Appropriate descriptions were created to describe the categories of relevant collected passages. This formed coherent themes. This step involved the necessary loss of information (Schmidt 2004).
iv. The theory of DCs was used to interpret the themes created in the previous stage. The theory identified specific DCs or patterns relating to practices, which develop and maintain the effectiveness of capabilities. The themes that were congruent with the theory were then described in detail (Schmidt 2004). The following model was used to simplify the analysis of the themes with the theory.

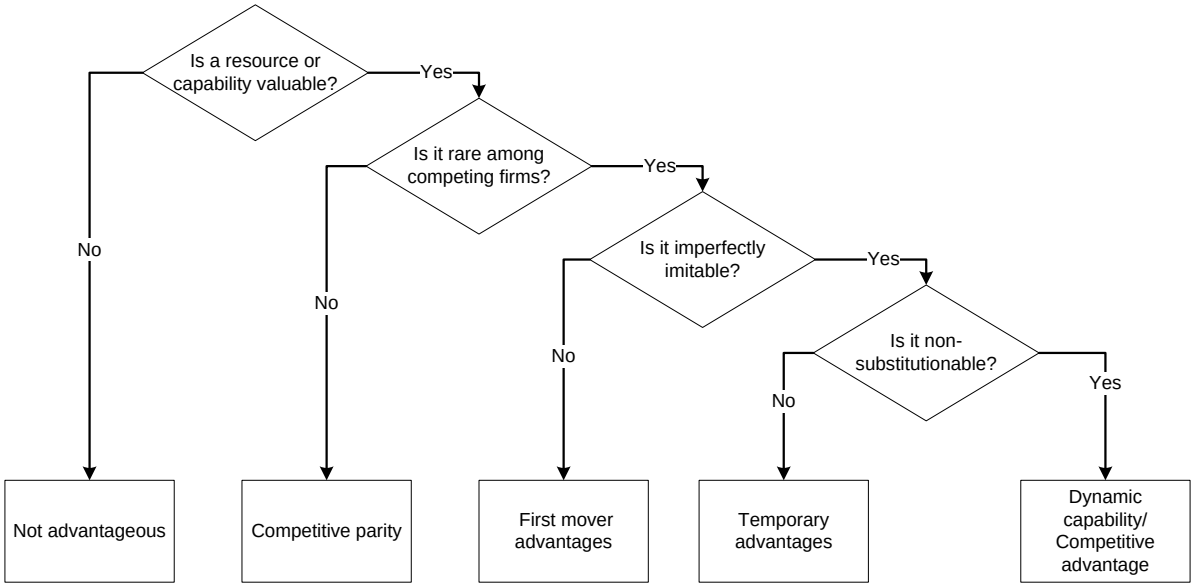

Figure 6: A dynamic capabilities model of competitive advantage (adapted from Mata et al. 1995:494)

Figure 6 is adapted from information provided in previous literature about the theory of DCs and the resource-based view (Barney 1991; Caldeira & Ward 2003; Mata et al. 1995; Wade & Hulland 2004). A discussion of this information is provided in section *3.4.1 Firm resources*.

4.5.3 Validity and reliability

There is no guarantee that case studies will deliver valuable data, regardless of how long the researcher spends in the field. The researcher's constructions are reliant on decent theory and perceptive analysis. Simply accumulating in-depth case study information does not guarantee these concepts in itself (Walsham 1995). The most accurate measure of determining the validity and reliability of the data is to verify whether it sufficiently satisfies the research questions stipulated in chapter 1 (Hofstee 2006). To make sure this is achieved, the interview questions were all created with close reference to the research questions. The interview data and findings are discussed in considerable detail in chapters 4 and 5.

Another method of ensuring reliability and validity of the study's findings is to very specifically describe all the procedures that were used to derive at the results. If the reader can follow a chain of derivation from the research questions through to the conclusion, then he will be better equipped to assess the quality of the study's findings (Benbasat et al. 1987). The reliability of a study is increased if the information presented can maintain a chain of evidence to allow the external observer to follow the derived evidence from the initial research questions to the final

study conclusions (Yin 2009). It is believed that this dissertation is presented in a way that makes this possible.

4.6 Ethical considerations

There were no obvious ethical dilemmas or potential harm within this study, but the researcher had to submit a request for ethical approval to the university's Ethics Committee before the interviews could start. The request included a registered research title, a research proposal, details about the data collection instruments and the template for the permission and informed consent letter(s). The committee approved the request (see their written reply in Annexure C).

All the interviewees were treated with respect. Before each interview, the participant was assured that he had the right not to participate or to withdraw from the interview at any time. Participants were also assured of their anonymity and the confidential manner in which their answers and identifiable details will be treated. They were provided with the names and contact details of the researcher's supervisors in case they needed to contact them. They were also informed of the purpose of the study and how their data will be used (Oates 2006). Each participant signed a letter to grant their written permission and informed consent.

The researcher did collect the identities of each participant because he had to contact them personally to schedule the interviews. However, their identities, as well as the identifications of their companies remain solely in the possession of the researcher and were not shared with any other person or entity. The identities of the participants are stored exclusively on the personal digital devices of the researcher. Only the employee position of each participant is revealed in this dissertation because it adds to the richness of the data and is thus to the benefit of the reader. Each company is referred to only as Company A, B, C etc.

4.7 Limitations

4.7.1 Number of participants

Due to the strict deadlines and time constraints of a master's dissertation, the researcher could only interview a limited number of participants per selected company. If more than one employee from each company could have been interviewed, an even more balanced view for each company would have been possible. This meant that since only one participant from each company was interviewed, it was important for the researcher to be very selective about who he chose to participate. The aim was to interview an employee with sufficient knowledge of the subject matter and consequent experience at the identified company. That is

also the reason why the job title of each participant is shared. The reader can now judge for himself what level of importance to attach to the answers of each participant. The single source of information from each company also necessitated the researcher to apply a deeper interpretative analysis of all the interviewee's answers.

4.7.2 Recording device

Using a recording device is sometimes seen as a limitation because it might inhibit the openness of information collected, especially if there is confidential or sensitive material involved (Walsham 1995a). However, in this study it did not seem to be a problem, as partway into the interviews, most of the participants became oblivious to the fact that they were being recorded.

4.7.3 Generalisation

Case study research should be careful not to lose focus of the main objectives of the study. It should keep in mind that the generalisability of case studies is an inherent problem and take care not to be misled by the subjectivity of the gathered data (Hofstee 2006). These shortcomings were all heeded when the conclusion of this dissertation was written.

Generalisations are always an issue with interpretive research and even more so with case studies (Walsham 1995a). Case studies are not designed to generalise populations or universes but to generalise to theoretical propositions (Yin 2014). Walsham (1995a) supplied examples of generalisations that are possible with interpretive case studies: a) the development of concepts, b) the generation of theory, c) the drawing of specific implications, and d) the contribution of rich insight. This study will focus on the third generalisation, which is the drawing of specific implications, but it will also extend an existing theory. It will focus on the specific implication that mobile ICT has on the strategic transformation of an SME.

4.7.4 Limited choice of data collection instruments

Another limitation to the study is the fact that triangulation was not used to increase the reliability of the data (Benbasat et al. 1987). The problem was that other data collection methods such as relevant documentation or archival records were simply not readily available in the small businesses who participated in this study. However, if more time was available, the researcher would have liked to use observation as a second data collection instrument. Disappointingly, this was also not possible

because the observational method needs more time than the researcher could afford. Despite this, as it is, this dissertation can still provide valuable insights. Benbasat et al. (1987:379) did research on qualitative case studies in information systems, and in the collection of articles they examined, almost half of them only used interviews as a data collection method. Consequently, although interviews on their own is not ideal, the qualitative interview is still a valuable data collection method of primary data (Myers 2010).

4.8 Concluding summary

While the results from a case study research method does not have the ability to provide accurately generalisable conclusions, it is believed that the information and the framework derived here will be helpful to both academics and practitioners who are interested in understanding the transformation that mobile ICT can generate in SMEs. The conclusion will provide a useful perspective to related research or organisational endeavours and extend the theory of DCs to include a new dynamic.

This chapter discussed the research design, methods and instruments followed during the research. It also made a specific attempt to ensure that the data was valid and reliable and that the analysis method is accurate and relevant to studying mobility in SMEs.

The next chapter provides the research findings according to the mobile DCs, practices and transformational levels achieved by the respective companies studied. All the findings are collected in a single table to improve its readability and contextual understanding. It also discusses detailed background information about each SME.

Chapter 5 – Data analysis and findings

5.1 Introduction

The previous chapter discussed how the research was conducted. It provided information on the research methods and strategies that were adhered to. The qualitative data gathering was categorised with interpretive methods. The interview data was analysed using the theory of dynamic capabilities to identify categories and themes. This chapter presents and analyses these results. Firstly, it provides comprehensive background information on each SME interviewed so that the reader can have a contextual reference by which to judge the findings. Secondly, the chapter presents and explains each of the mobile dynamic capabilities (DCs) identified in the interviews. DCs are a strategic prerogative for achieving competitive advantage and consequently, they provide an important understanding into the strategic use of mobile ICT. The chapter also discusses common practices that are necessary to develop and sustain these DCs. Finally, the chapter discusses the level of transformation that mobility has incited in each of the companies. All the findings are combined into one comprehensive table to improve readability and understanding.

The data gathered in any research project, whether through methods like experimentation, surveys or interviews, brings uniqueness to the research. Data can be categorised into either primary or secondary data. Primary data is unpublished information gathered directly from people or organisations by the researcher, whereas secondary data is gathered from previously published journals, articles and books (Myers 2010). Up until this chapter, the study has discussed secondary data. Although secondary data is important to impart an understanding of the subject matter, primary data is necessary to provide the contribution to the relevant field of study, as required of a research project. This chapter describes the background information of the SMEs interviewed. All the information that is necessary for the reader to draw his own conclusions about the companies that were analysed, are discussed in the next section.

It is good practice to interview many different candidates in a company because the amalgamating of different voices provides the most comprehensive data (Myers & Newman 2007). However, as discussed in chapter 4 (4.7 Limitations), it was found that in the case of SMEs, the businesses are so small that there are usually only one, or at the most two employees, who hold a sufficient holistic view of the mobile operations and strategic vision of their company. In some cases the employee may well specialise in information technology, but in most cases, it turned out that the manager or the owner of the business was in fact the guide and gatekeeper of relevant information.

5.2 Company background

A total of ten participants from ten different companies were interviewed. To ensure company confidentiality, each company is presented by an alphabetical letter, for example company A. The descriptions below will discuss background information about each company, as well as information relevant to mobility. The information discussed is derived directly from the interviewees. Information about the number of employees, the number of employees using mobile ICT, the years the company has been in operation and the industry sector, can all assist the reader to form a comprehensive picture about each of the companies. The following constructs will also be discussed:

- ***Interaction*** – Provides information on how the firm's personnel predominantly communicate with each other and serves to illustrate the context of each company.
- ***Environment*** – Provides information regarding the turbulence of the external environment. The level of environmental turbulence could have a major influence on the way that dynamic processes are applied (Eisenhardt & Martin 2000).
- ***Company values*** – A company's values can have a major impact on how well technology resources are exploited. For instance: "*a culture that embraces and encourages change and experimentation, minimises fear of failure, and welcomes opportunities to apply new IT developments*", will have remarkable success at exploiting mobile DCs (Powell & Dent-Micallef, 1997:384).
- ***IS/IT competency levels*** – IS/IT competency levels of employees are a determinant to success for IT adoption (Caldeira & Ward 2003). It will influence the efficiency at which mobility is utilised in the company.
- ***Mobile maturity*** – Provides a short description about how mature the company's use of mobility is, according to the interviewee. This evaluation was derived from answers provided by the interviewees to questions in the interview questionnaire, which required the interviewees to describe the mobile maturity in their company. The descriptions entail the following categories: (a) Companies who have started to publish their data and processes in a mobile format; and have started to enjoy the basic benefits of mobility, such as geographical and temporal independence - are categorised to have an average maturity level. (b) Companies who have started to redesign their processes according to mobility; and have started to make radical changes to their business model - are categorised to be very mature in mobility. (c) Companies who have integrated mobility into its competitive advantage; who have made mobility an essential component of their business strategy; and who have shaped their work practices according to the functionalities of mobility – are categorised to be exceptionally mature. (d) Companies who have utilised mobility to enhance their business strategies;

who have invented entirely new ways of conducting mobile business and established new capabilities; or who have influenced a redefinition of entire industrial markets – are categorised to have the highest possible maturity in mobility.

At this point in the discussion of the company backgrounds, it is suffice to condense the interviewee's answers into a short description. A detailed discussion of the mobile maturity of each company will be expanded on in section *5.3.3 Mobile transformation observed in the interviews,* when the interviewees' answers are combined with the researcher's data analysis. At the end of chapter, Table 9 provides a collective summary of all the information discussed in this chapter.

The context of each company is fully described because, according to Myers (2010), it is vital to understand the context of each business as this imparts relevance to the data.

Company A

Company A is a residential estate management business. It is an estate property that is managed with creativity and vigour, and it radiates a sense of relaxed openness. The estate is managed by an office that protects the interests of its residents. Both the manager and the administration team have cultivated a reputation of competence and compassion. It has a creative and highly successful visitor access system, which has only been appropriated by very few in the same industry. The system enables the residents to enjoy the convenience of technology controlled from their mobile phones.

Company A is managed by a board of directors and a dynamic administrative team. The general manager was the candidate interviewed for this study.

Number of employees: 6

Number of employees using mobile ICT: 3

Years in operation: 13 years

Industry sector: Catering, Accommodation and Other Trade (Department of Trade and Industry: South Africa 2008).

Interaction*:* Employees usually interact through fixed line telephones and e-mail, with a heavy reliance on mobile phones. Communication with suppliers is mostly done via e-mail. Mobile phones are predominantly used for incoming calls to save costs and to ensure the continuous availability of the manager. Communication with residents is done via e-mail and by using a bulk SMS

system.

***Environment**:* The competitive environment of this type of business is different from standard companies, as it does not involve chasing market share. It seeks an amicable and collaborative relationship with other similar companies, whereby many recipes for success are shared. It competes with those companies by reputation alone. It operates in a steady and slow-paced environment.

***Company values**:* Company A has a culture of partnership and of listening to the requirements of each resident and then swiftly acting upon it. The directors are dynamic, very hard working and motivated to seize and appropriate new IT technologies.

***IS/IT competency levels**:* Most of the directors have high competency levels in IT. However, the general manager is still very inexperienced in IT.

Mobile maturity: Company A has an average mobile maturity, but it has undergone a recent mobile transformation due to the successful adoption of some innovative mobile solutions.

Company B

Company B is a total-information technology solutions provider. It has been in operation in the IT solutions sector for 26 years and has outlived most of the major technological changes. The company's longevity is a relatively rare occurrence in this particular industry. They primarily do business with SMEs as a managed services provider. They provide their clients with total IT solutions, which include hardware management, software management, network management, cloud computing, device management and hardware and web security. The company has a small team of IT professionals who are extremely competent in what they do: aligning the capabilities of IT to their clients' business strategy. Company B is dynamic, motivated and skilled.

The managing director was the candidate interviewed for this study.

Number of employees: 10

Number of employees using mobile ICT: 8

Years in operation: 26 years

Industry sector: Transport, Storage and Communications (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Communication between employees is predominantly via e-mail on their computers. However, they also rely heavily on a variety of mobile

devices, like mobile phones, tablets and notebooks to access e-mail. The company ascribes a lot of their success to the ability of their employees to fully function from anywhere at any time, without the hindrance of a geographical location. Sales personnel and engineers can also be tracked by their mobile devices. This provides the company with a good measure of control, as well as the ability to respond more efficiently to the requests of clients. Communication with clients and suppliers is also done via e-mail.
***Environment**:* The environment is extremely competitive and dynamic. Company B's market share is never certain and they have to work hard, not only to increase it, but also to simply retain what they have.
***Company values**:* They strongly believe in nurturing meaningful and beneficial relationships with their clients. They further believe that success comes from a culture of quick-response times to their clients' requirements. In addition, they believe in a culture of integrity and they never lie to their clients.
***IS/IT competency levels**:* The company mostly consists of IT professionals with very sophisticated IT skills.
***Mobile maturity**:* Company B is exceptionally mature in mobility.

Company C

Company C is a full telecommunications operator, as well as an Internet solutions provider (ISP). It specialises in the installation, maintenance and management of IT solutions on fibre-optic networks. Its services span a wide range of business and residential solutions. They provide their clients with full end-to-end managed solutions. Specific to mobility, they provide their clients with high-speed wireless Internet access, mobile VoIP functionality, cloud services, e-mail collaboration and managed access services. GSM functionalities provide them with the ability to wirelessly manage all wireless infrastructures. Company C has a strong team of well-qualified IT professionals. They all use a variety of mobile devices and functionalities that form part of the day-to-day operations, with remarkable efficiency. The company was awarded first prize as a preferred ISP by the Association of Residential Community (ARC).

The operations manager was interviewed for the study.

Number of employees: 9

Number of employees using mobile ICT: 9

Industry sector: Transport, Storage and Communications (Department of Trade and Industry: South Africa 2008).

***Interaction**:* E-mail is the preferred method of interaction because of availability. Employees are accessible via e-mail even when they are out of the office. Mobile ICTs are often used to access e-mails and it makes communication more convenient and much quicker. Communication with clients and suppliers is also via e-mail because most businesses require a written trail of communications.
***Environment**:* The ISP environment is very competitive, but company C does not have any competitors who pose a direct threat because they are light years ahead of the competition. Company C operates in a dynamic, quick-changing environment.
***Company values**:* The company has a culture that is open-minded about technology and they believe that more can be achieved when a large variety of technologies are used.
***IS/IT competency levels**:* They are at the forefront of technology and will continuously send someone on training to learn the skills required by new technologies. The company consists of IT professionals with diverse and advanced IT skills.
Mobile maturity: Company C is exceptionally mature in mobility.

Company D

Company D is a retailer of computer-aided design (CAD) software. The software that it supplies is specifically designed to enhance productivity in mechanical engineering design. The company consists of an experienced team of engineers that specialises in mechanical design and automated manufacturing software. Their sales force is 'road warriors', as they spend all day, every day travelling to see clients and conduct their work from mobile phones and notebooks. They pride themselves in their ability to use mobile devices to quickly respond to client requests.

One of the sales engineers was interviewed for the study.

> Number of employees: 35
>
> Number of employees using mobile ICT: 35
>
> Years in operation: 22 years
>
> Industry sector: Wholesale Trade, Commercial Agents and Allied services (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Employees prefer to interact with each other via e-mail because it is a cheaper alternative. Accessing e-mail from mobile devices is heavily

relied upon, especially by the sales force. Communication with clients and suppliers is also predominantly done via e-mail, but the company also relies on face-to-face visits. Mobile ICTs have strengthened collaborative partnerships with clients and suppliers because it made communication much quicker and more convenient. However, the managerial team has not capitalised on this temporary advantage and has kept the company in a state of dormancy for the last five years.

***Environment**:* The company has many competitors, however, mobility has provided an advantage over the competition because their competitors are still reluctant to embrace the accessibility that the use of mobile devices offers. The environment is more or less stable and it has not changed in the last five years.

***Company values**:* Company D has a culture of sound and open communication. It is a culture that emulates family values like respect, camaraderie, lenience and trust. Frequent teambuilding exercises and outings are held.

***IS/IT competency levels**:* The professions of the employees are mostly engineers and sales personnel. Their IT competency is generally rather low.

***Mobile maturity**:* Company D is not as mature as the other firms in the study. It has an average maturity level in mobility.

Company E

Company E is a non-profit organisation that hosts public functions and also conducts live broadcasting on national television. Although this company might be seen as a peculiar candidate, it was chosen because of its very sophisticated and innovative methods of using mobile ICT as part of their daily operations. They use mobile devices, tablets, wireless connectivity, cloud computing and notebooks to support anytime, anywhere work practices and to communicate via phone calls, e-mails and instant messaging. They also use some innovative mobile solutions to simultaneously manage different sound desks and to display functionalities from a tablet.

The head sound engineer was interviewed for the study.

Number of employees: 62

Number of employees using mobile ICT: 62

Years in operation: 18 years

Industry sector: Community, Social and Personal Services (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Employees interact with each other via telephone and e-mail. Smartphones and tablets are used regularly to access and manage e-mails. E-mail and text messaging is often used to contact clients.
***Environment**:* The nature of this company distinguishes it from the other companies interviewed because it is not in competition for market share with anyone else. They do, however, strive to utilise technology to the best of their ability.
***Company values**:* The company has a family-oriented culture, is motivated to try new things and to experiment with new technologies.
***IS/IT competency levels**:* They have average levels of IT competency because the younger employees tend to be very forward thinking about new trends in IT, yet the older personnel still revert to using the phone and text message functionalities.
***Mobile maturity**:* Company E is very mature in mobility.

Company F

Company F is a developer of computer-aided design (CAD) software. Its headquarters is in Cardington United Kingdom, but the bulk of their staff is based in Centurion, South Africa. It develops CAD software, for the construction industry, which is easier to use and more compatible to integrate with other necessary systems. They utilise this ability to great effect and success in their business. Their efficiency in mobility is seen as a distinguishing factor and is one of their keys to success.

The sales manager was interviewed for the study.

Number of employees: 14

Number of employees using mobile ICT: 14

Years in operation: 17 years

Industry sector: Construction (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Technologies in e-mail, instant messaging, text messaging, telecommunications, video-conferencing and document sharing are used as mediums for interaction between employees and between the company and clients or suppliers. The company also prefers personal visits to clients because it promotes relationship-building and trust. Mobility has incited convenient partnerships with clients because the product is developed to

encourage them to use mobile devices when they travel and when they go to building sites. It makes the company's product very desirable. In addition, they are the only company in their class that provides their clients with live software support and remote assistance even while they are on building sites. They can remotely log into mobile devices and fix any problems as long as the client has Internet access.

***Environment**:* Company F operates in a dynamic and competitive environment. They are extremely proud of being the only local developer of CAD software and that they are able to compete against multi-national conglomerates. Although they are very successful, it is not an easy task and they have to constantly reinvent themselves to remain competitive.

***Company values**:* According to the interviewee, their personnel are incredibly proud of the company and they exhibit real heart and soul in their work practices. They also take pride in the fact that they are one of the few companies that can compete with an international brand head-on – with remarkable success. They have a culture of integrity and candid honesty.

***IS/IT competency levels**:* The employees are mostly professional software developers and they all have very high IT competency levels.

***Mobile maturity**:* Company F is exceptionally mature in mobility.

Company G

Company G is an architecture firm based in Centurion, Pretoria. They have been the recipient of numerous prestigious awards, bearing testimony to their skills and talent. They are a young and dynamic company that places high value on the importance of technology. Consequently, they have equipped the office with the latest graphics, architectural 3-D software and information technologies on the market. They have been effectively using mobile ICTs from the start and they hold a reputation as 'the architects with the tablets and the smartphones'. Company G often experiment with new information technology and software and even started creating a mobile website.

One of the architects was interviewed for the study.

Number of employees: 10

Number of employees using mobile ICT: 10

Years in operation: 13 years

Industry sector: Construction (Department of Trade and Industry: South Africa 2008).

***Interaction**:* The office is small enough for the employees to simply speak to each other. When someone is not in the office, which often happens in their line of work, they would contact the person by phone, text messaging or instant messaging. They prefer to either e-mail or call their clients and suppliers.
***Environment**:* The architecture environment is very competitive. Mobility has provided the company with flexibility and it has also distinguished them from competitors by enhancing their perceived status when the employees use their tablets and smartphones in meetings, at building sites or other gatherings.
***Company values**:* They have a culture of teamwork and dedication. They pride themselves on being original, stylish and ahead of the technological trends. They spend time to ponder the advantages of new technological inventions long before competitors have even considered it.
***IS/IT competency levels**:* The architects rely on strong performing computers, and powerful design software to complete their work. The regular use of complicated software has developed high levels of IT competency and employees regularly do IT installations themselves.
***Mobile maturity**:* Company G is very mature in mobility.

Company H

Company H designs and builds large industrial lasers, which are used in space exploration and aviation. They are a scientific and a manufacturing company that regularly achieves scientific breakthroughs by designing advanced machines with previously unheard-of functionalities. They are one of the only companies in the world that can do what they do and consequently, they have built an international community of clientele. They are required to keep knowledge and processes secret as they are a regulated company that are often used by defence forces. Accordingly, they take extreme measures in mobile security when they travel to certain volatile countries. Company H is a truly mobile company and they effectively use technology to work and collaborate from any location in the world.

The managing director was interviewed for the study.

Number of employees: 13

Number of employees using mobile ICT: Only the senior employees like the managers, engineers and scientists.

Years in operation: 13 years

Industry sector: Manufacturing (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Employees collaborate through online videoconferencing, live file sharing applications and smartphones. They also communicate with each other via e-mail and instant messaging. The same methods are used to interact with clients and suppliers.
***Environment**:* Company H is largely alone in their field with only one or two competitors. Their environment is stable in terms of competition, however, because the market is rather small, they constantly reinvent and re-engineer themselves to gain new clients.
***Company values**:* The reputation to deliver regardless of the challenges makes company H truly remarkable. They only hire personnel who promise to be faithful and who are dedicated to go the extra mile for the client. They have a culture that strongly insists on integrity and honesty. They believe that these qualities are favourably adding towards a growing reputation.
***IS/IT competency levels**:* The employees of company H are all professional scientists and engineers who tend to have very high levels of IT competency. The fact that they employ IT devices very successfully to communicate and collaborate with travelling employees, has also increased their efficiencies at using new technologies.
***Mobile maturity**:* Company H has exceptional maturity in mobility.

Company I

Company I is an online mobile ICT retailer. They offer complete mobile computing solutions and aim at elevating their clients' businesses by regularly sharing knowledge and expertise. They offer the very latest technologies in mobile computing and educate their clientele to use the technologies to work from anywhere, anytime. They are a dynamic and innovative company with the enthusiasm to provide the best possible service to clients. Client satisfaction is their main goal. They also efficiently use mobile ICT to collaborate within the company itself and to manage their sales force. They have an excellent reputation in the community and their superb client service has furnished them with a high rate of client retention, despite the strong competitiveness of their industry.

The sales manager was interviewed for the study.

Number of employees: 32

Number of employees using mobile ICT: 32

Years in operation: 16 years

Industry sector: Wholesale Trade, Commercial Agents and Allied services (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Employees predominantly communicate via e-mail and access their e-mail accounts from a variety of mobile devices. They also use a VoIP telephone system, which enables cheaper mobile telephonic conversations. Communication with clients and suppliers is also conducted via e-mail.
***Environment**:* The external environment is extremely competitive and dynamic, as there are a myriad stores and franchises that sell mobile technologies.
***Company values**:* The company has a culture that encourages healthy competition among employees to be innovative. Various incentive programmes reward their winning ideas with cash prizes and small bonuses.
***IS/IT competency levels**:* Most of the employees are either educated or experienced in IT.
***Mobile maturity**:* Company I is exceptionally mature in mobility.

Company J

Company J is a large wholesale distributor of optical equipment. They distribute one of the largest brands in cameras and optics. They are a vibrant and lively company with a massively interactive online presence. The CEO declared that the company is currently 89% mobile and they are expecting it to be fully mobile by the end of the financial year. They have custom developed many mobile software solutions and they are truly beyond comparison in their efficient mobile processes. *"We have put funds aside and employed programmers to literally write mobile applications and software solutions for our company"* (Company J). They have an enormous sales force that spends a large portion of their working week away from the office. All salesmen are issued with a tablet that enables them to process sales while they are meeting with the client. Their mobile devices also deploy GPS functionalities to plot the exact time that the salesman enters and leaves a client's office. With this information, the company can become more efficient in time management by determining: a) which sales personnel require more training, b) with which clients they need to spend more time and c) how to minimise the distance travelled by each salesman. The GPS functionality also enables them to accurately plot the geographical area reached by their products and consequently, they can determine areas where they need to expand.

The CEO was interviewed for the study.

Number of employees: 185

Number of employees using mobile ICT: 185

Industry sector: Wholesale Trade, Commercial Agents and Allied services (Department of Trade and Industry: South Africa 2008).

***Interaction**:* Employees use mobile ICT very efficiently to increase their mediums of interaction with each other. It has significantly improved the speed of communication between the sales manager and the sales force. Mobile ICT is also used quite effectively for merchandise arrangements in stores. Company J can now send images to their clients to show them how the merchandise should be arranged and what adverts need to be displayed. The client can then send images back to the company to assure them that their instructions have been met. They believe that mobile ICT has improved relationships and the effectiveness of interactions with both clients and suppliers.

***Environment**:* The environment is dynamic and competitive with many distinguished international players. Mobility has provided a unique advantage, specifically when compared to direct competitors who have not gone mobile. It has improved client service provisions and client interactions.

***Company values**:* The company has *a* culture that insists on efficient communication and effective collaboration. They have incentive programmes that encourage employees to brainstorm new ideas. This has sparked a culture that strives to make the best use of new technologies.

***IS/IT competency levels**:* IT competency levels are very high and IT training is a major priority.

***Mobile maturity**:* Company J has the highest possible maturity in mobility.

During the interview, each candidate was asked to indicate specifically what type of mobile technologies they use in their organisation. Their responses are recorded in the following table (Table 5).

Table 5: Specific mobile technologies used in each organisation

	Company									
Technology	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Mobile phones	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Mobile Internet	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**

Mobile e-mail	X	X	X	X	X	X	X	X	X	X
Mobile calendar	X	X	X	X	X	X	X		X	X
Mobile website		X		X					X	X
Instant messaging		X	X	X	X	X	X	X	X	X
Wireless networks	X	X	X	X	X	X	X	X	X	X
Laptops	X	X	X		X	X	X	X	X	X
PDAs or smartphones		X	X	X	X	X	X	X	X	X
Tablets		X	X	X	X		X		X	X
Anytime, anywhere services (including location awareness)		X			X	X			X	X
Cloud computing		X		X	X		X		X	X
RFID (radio frequency identification) tagging										
Mobile applications (employees/clients/suppliers)		X	X	X						X
Bring your own device service policy	X	X		X						
Other						X				

Table 6 presents the candidates' answers to the question: *Has the use of mobility had any of the following impacts in your company? Yes or no?* The letter 'Y' represents a 'yes' answer and the letter 'N' represents a 'no'.

Table 6: Types of benefits received from mobility

		Company									
Types of benefits (Basole 2007)	**Details**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Strategic benefits	Greater client satisfaction, enterprise visibility into assets and resources, higher return on investment, enterprise process visibility (Basole, 2007; Frost & Sullivan Whitepaper, 2007; Zetie, 2005).	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Informational benefits	Rapid decision making due to the accessibility of information and resources, immediate access to required information (Basole, 2007; Sorensen, 2004).	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Transactonal benefits	Cost reduction (specifically in communication), improved productivity regardless of location, improved time management, trusted accuracy, real-time data transmission (Basole, 2005; Frost & Sullivan Whitepaper, 2007; Sorensen, 2004).	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
Enterprise transformation	The fading of organisational boundaries, healthier teamwork, corporate control, a horizontal organisational culture (Basole, 2005; Frost & Sullivan Whitepaper, 2007; Sorensen, 2004).	**N**	**Y**	**Y**	**Y**	**Y**	**Y**	**N**	**Y**	**Y**	**Y**

Both Table 5 and Table 6 are valuable in providing further information about the context of mobility in each company and the value that each company derives from it. Table 6 also provides information expressed by the interviewed candidates about whether they have perceived any mobile transformation in their company. It was indicated that company A and G have not experienced an enterprise transformation subsequent to their use of mobility.

5.3 Findings

5.3.1 Mobile dynamic capabilities

This study is involved in measuring the aptitude of SMEs to develop DCs that will allow them sustained success in the dynamic environment of mobility, in the form of mobile transformation. One of the objectives of the study is to identify DCs that are necessary for mobile transformation, across different industries. All the SMEs studied leveraged complementary bundles of resources that were either to a greater or a lesser extent consistent with the attributes of DCs and necessary for either the purposeful or tacit development of value-creating strategies. All the candidates described how mobility has drastically influenced their processes and increased their competitiveness in their respective industries. The majority of the companies studied had achieved mobile transformations at different levels of learning and in every case study there were resources that made the transformations possible. The particulars of the mobile transformations will be discussed later in this chapter after the specific DCs and the practices that developed and maintained them have been sufficiently discussed.

Table 7 names the particular DCs that were recognised during the case studies and also indicates how frequently they were observed across the ten cases. As discussed in Chapter 3, it is believed that although DCs are idiosyncratic, they do share commonalities with the features of other accomplished processes across industries (Eisenhardt & Martin 2000). Eight distinct capabilities were identified in this

way. Many of the capabilities, listed in Table 7, are associated with innovation to converge to the particular characteristics of the mobility environment and they are comparable with the framework of innovation capability developed by Lawson & Samson (2001). Outstanding companies invest in and nurture innovation. This enables the execution of effectual innovation processes and leads to new innovations in products, services and processes, and subsequently causes superior business performance. Lawson & Samson (2001) advocated a new operating model that views extensive investments in the innovation capability as the principal creator of prosperity, rather than the ownership of the physical asset itself. In the same way, the possession of mobile ICTs itself will not lead to superior performance, but rather, the effective execution of innovative mobile processes will lead to the enhancement of products, processes and services, and thus lead to superior business performance. Table 7 also indicates whether the eight DCs discovered in this study, share any common attributes with the DCs asserted in previous studies. Each capability will be discussed individually and the commonalities shared with any previous research will be explained.

Table 7: Mobile transformation dynamic capabilities (Table format adapted from Daniel & Wilson (2003:287)

Dynamic capabilities	**Observance in the interviews**	**Examples from cases**	**Comparative to other studies**	**Type of dynamic capability** (Lawson & Samson 2001)
Envisioning client value	A, B, C, F, I, J	"*As long as he has Internet access, then we can provide him with live support irrespective of where he is*" (Company F). "*It has definitely improved the relationships and the effectiveness of our interactions with our clients*" (Company J).	(Wu & Hisa 2008)	Innovative (organisational intelligence – learning about clients)
Integrating mobility with the business strategy	A, C, E, F, G, H, I, J	"*We need to look at what we want to achieve and then we have to look at whether a particular mobile technology meets our needs*" (Company C). "*Mobile has provided us with strategic advantages*" (direct translation from Afrikaans – Company H).	(Powell & Dent-Micallef 1997)	Innovative (management of technology)
A visible commitment from top management	A, B, C, E, F, G, I, J	"*The current guys [directors] are very motivated for it [mobility*]" (direct translation from Afrikaans – Company A).	(Bharadwaj et al. 1999; Caldeira & Ward 2003)	Innovative (harnessing the competent space – innovation champions)
High IT competency levels in employees	B, C, F, G, H, I, J	"*Technology is only as good as your training and the way in which people use it. Many times companies make the mistake of getting excited about new technologies, but then it stays there and never gets utilised properly. I think we see training as a vital part of the whole induction process and vital to making technology effective*" (Company J)	(Caldeira & Ward 2003)	Innovative
A commitment to regular research mobility	A, B, C, D, E, F, G, I, J	"*We keep a close eye on what is available in the market. Employees are regularly sent to technology exhibitions"* (direct translation from Afrikaans – Company A).	(Bharadwaj 2000; Day 1994; Powell & Dent-Micallef 1997)	Integrative

Implementing unique and innovative mobile work procedures	B, C, F, H, J	"*I think that if you look at the last ten years, we used to do business plans and strategies that lasted for 3 to 5 years. Those days are over. Now, we literally strategise or reinvent ourselves on a yearly basis and sometimes even during the year we have to make changes. I think the whole world demanded faster reaction time and being more proactive and I think that's where mobility has come in and assisted us to do these changes much quicker and within the turnaround times that we need to accomplish it*" (Company J).	(Wu & Hisa 2008)	Innovative (vision and strategy)
Utilising mobile ICT with inimitable processes	A, B, C, D, F, G, I, J	"*The only way to distinguish oneself from competitors is the efficiency in which technology is utilised*" (Company B). "*I think that anything can be copied, but when you're the first in the market with new technology it is very hard for competitors to catch up*" (Company J)	(Barney 1991)	Integrative
Company values that complement the inherent qualities in mobility	A, B, C, D, E, F, H, I, J	"*Have you got the same culture that we have in terms of honesty and openness and communication*" (Company H)	(Bharadwaj 2000; Powell & Dent-Micallef 1997)	Innovative (structures and systems/culture and climate)

Envisioning client value

This dynamic capability conveys new client value propositions by exploiting mobility's functional attributes like: mobility, localisation, personalisation and convenience. It also sets out to educate clients on the usability of mobility and mobile commerce. It is consistent with the observation regarding IT capabilities by Wu and Hisa (2008) and the innovation capabilities by Lawson and Samson (2001).

> *"Innovators create an awareness of customers – both internal and external – which extends throughout the organisation. Employees are actively encouraged to search our customer needs and problems, both known and latent, in order to solve them in a value adding manner" (Lawson & Samson 2001:392).*

The interviewees described how mobility has opened new avenues for business in gaining new clients and delivering services that were previously impossible. "*Mobile technology makes us more flexible and it places us in a fortunate position for having more customers. It does not matter where you are only what services you require and then we will find a way to provide you with those services*" (Company C). Company B often incorporates new mobile technologies into their service plan because they believe it can attract and provide value to their clients. Company I believes in sharing knowledge with clients. They believe that they can uplift them through education and when their clients prosper, they build greater trust and loyalty towards them. This has become a reliable method of client retention. Company J also concurred that mobility has improved professionalism because information is now more accessible. They can now assist clients in improving their own businesses by sharing knowledge and experience. Mobility has also enabled company J to share interactive product information with their clients, accessed via mobile devices. They often sent pictures to their clients that illustrate how they want their products to be shelved, organised and where to place advertisements and specials. The client can then take a picture of the products after they have arranged them and send it back to company J for review.

Mobility has enabled levels of after-sales client support that was previously not possible. It has increased the frequency and the convenience of interactions. The interviewees revealed that their clients can now be confident that they will receive the highest levels of support on any product (Company B, C, F, I). Clients can now be furnished with live support even when they are in remote locations (Company F). Mobile ICT also improved the relationships and the effectiveness of interactions with clients (Company J). The interviewees also believe that one method for achieving success is to use mobile technology to quickly respond to any client queries (Company B, F). "*Ek glo 'n timely response vir 'n kwotasie is beter as 'n fancy kwotasie*" ("*I believe a quick response for a quotation is better than a fancy quotation*" (Company F)). The increased service levels and after-sales satisfaction provides greater value propositions for the client. This dynamic capability has been

enabled through the functions of mobility and it has brought about a transformation in the companies that were interviewed. It expands the strategic applicability of mobile ICT to include new goals and directions in client satisfaction.

Integrating mobility with the business strategy

This is a capability that emphasises the influence that mobility can have on competitive advantage if it is integrated into the business strategy. Powell and Dent-Micallef (1997:384) concurred with a similar DC regarding the "*integration of IT planning with the overall goals, strategies and strategic planning processes of the firm in attempt to fit IT into strategic objectives rather than adopt IT for their own sake*". For companies to succeed at innovative work procedures, they need to be able to combine their technology strategies with the business strategy in an innovative coupling (Lawson & Samson 2001).

As anticipated in the literature review, there were some companies interviewed that did not participate in any strategic planning (Blili & Raymond 1993; Dyerson et al. 2009; Ghobakhloo et al. 2012). In some cases the reasons provided were that the companies were simply too small to conduct strategic planning or that the managers were too miserly and reluctant to make any significant investments in mobile technology or strategic planning (Company B, D).

In contrast to the assumption made in the literature, the results from eight out of the ten companies interviewed indicated that strategic planning capabilities were indeed an important procedure. It seems that this capability is partly an issue of aligning mobility with the business strategy, as is the case with company E, when the future of mobility is discussed during business strategy planning sessions. The sessions will discuss new technologies, how technologies can save cost and how upgrades can provide advantages. Company G make efforts to expand the influence of their business strategy by incorporating the functionalities of mobile phones, tablets and mobile web development. However, in more transformative functions of mobility, it is not adequate to only derive a mobility strategy from the corporate strategy. Instead, it is necessary to develop a tauter integration. This requires the operation of a formal feedback loop in planning procedures, stretching from the mobility strategy to the corporate strategy, to guarantee that opportunities for transformation are seized (Daniel & Wilson 2003). This was confirmed by the research of Teo and King (1997), concluding that information systems planning is most efficacious when it is 'indistinguishable' from business strategic planning, occurring 'simultaneously and interactively'. This approach to the indistinguishable integration between the mobility strategy and the business strategy was concurred to achieve the most successful results in the SMEs interviewed (Company C, F, H, I, J). These companies indicated that they make an extensive effort to incorporate mobility with aggressive business goals, strategies and strategic planning procedures. Company J admitted that mobile

is a massive part of their strategy and that they even encourage the creation of specific budgets to further expand developments on mobile technologies every year. Company J uses mobile technologies to help them discover new markets and to plan strategically when they need to pursue these.

> "*I think the whole mobile industry has brought a different way of thinking into the market and into business and I think the important part is that we embrace it and use it correctly. It is important to ensure that we use it to enhance our businesses. Because, you can get very hung up on the clutter of information that is out there, but, I think, if you know what your strategy is and how you are going to use mobile devices, you can actually use it very beneficially to your business, your work processes and the way in which you operate* " *(Company J).*

Company H indicated that they have a dedicated IT department that frequently attends corporate strategic planning sessions. Company I was distinct from the other SMEs because it was the only company to concede that the mobile trends in the market definitely determine the strategic approaches they plan to take. That is because they attempt to stay ahead of the trend and to be leaders in technology. The other companies were more conservative and applied an approach similar to what Powell and Dent-Micallef (1997) suggested. They only incorporate the mobility technologies that complement their business objectives, not the other way around. "*Mens kan nie bekostig om miljoene dollars per jaar te spandeer aan tegnologie nie. So, daarom is dit belangrik om dit goed te beplan*" ("*One cannot afford to spend millions of dollars per year on technology. Therefore, it is important to plan it well*" (Company H)).

Mobility has become integral to the survival of companies in today's economy and deserves careful planning according to business strategy. "*We see a clear pattern in the market concerning companies, and even some of our customers, who do not reinvent themselves every year, they are the ones that are struggling and many of them even close down*" (Company J).

A visible commitment from top management

This capability stresses the importance of having a clear and visible commitment from top management towards mobility initiatives. Managerial influence in IT initiatives is important to obtain successful implementations (Bharadwaj et al. 1999). Some researchers believe that constructive managerial IT skills is one of the only DCs that can favourably affect sustainable competitive advantage (Caldeira & Ward 2003; Mata et al. 1995). Mata et al. (1995) investigated the relationship between five vital IS resources and the firm's performance by utilising resource-based view (RBV) as an underpinning theory. RBV shares most of its attributes with the theory of DCs.

They concluded that only the capability of 'managerial IT skills' has any empirical evidence to influence sustained competitive advantage. This was concurred by most of the interviewees. To successfully assemble resources into coherent bundles of capabilities, it is necessary to receive the support of key managerial staff to assume the roles of technological gatekeepers, business innovators or organisational sponsors (Lawson & Samson 2001). Eight of the ten companies interviewed declared that the managerial team have high motivation levels for mobility. Their top management is open, proactive and inclined towards mobile ICT. Company I indicated that their managerial staff tries to remain abreast of technological movements, makes the effort to discover new products, and then searches for people who can make those ideas happen. Company A declared that they can attribute their success to the motivated attitudes and very hard work of the directors.

High IT competency levels in employees

Caldeira and Ward (2003) recognised that the dynamic capability of IS/IT competencies of employees has a genuine influence on the successful adoption of IT. Previous research has also emphasised the importance of respectable IT talents in managers (Mata et al. 1995). In this study, seven of the eight companies that were interviewed, were very mature in mobile transformation, and also had employees with a high average level of IT competency. Therefore, based on this majority, there is a positive correlation between high IT competency levels and mobile maturity (Company B, C, F, G, H, I, J).

However, three of the seven companies leave their employees to educate themselves on how to use new mobile technologies, because they either do not have dedicated IT personnel, or due to economic restrictions they have personnel shortages and therefore do not expend resources on IT training (Company B, G, I). The other four SMEs were strong advocates of IT training and they also regularly send employees to either attend IT-related conferences, or on training seminars to learn new IT skills, or they frequently circulate educational e-mails to employees with IT security alerts and information that increases IT knowledge (Company C, F, H, J).

The two different approaches to IT training do not appear to have had any noticeable effect on the success of mobility advancements between the two groups. This contradicts the results of Powell and Dent-Micallef (1997). They found that IT training is one of the few business resources that positively contribute towards performance. It is possible that this is not a true contradiction at all. It is most probable that Powell and Dent-Micallef refer to IT training as a means to elevating the IT competency levels of personnel. Since the IT competency of personnel in company B, G and I were already high, the 'neglect' of IT training did not cause an immediate noticeable difference.

A commitment to regular research mobility

This capability involves a commitment to regularly research and investigate new mobile technologies. It encompasses a devotion to the processes of researching and observing the activities that provide success to other firms (Powell & Dent-Micallef 1997). It is an integrative capability that enables firms to disseminate knowledge from peripheral sources and integrate the different technical competencies developed into relevant company departments (Lawson & Samson 2001). Not all the companies interviewed shared a commitment to research, but it did appear to be a great advantage in discovering innovative services and work procedures for the nine companies that do practice it. These companies also exhibited a strong belief in the value of continued research. Most of the firms keep a close eye on what is available in the market and employees are regularly sent to conferences and exhibitions. They also maintain a deliberate awareness of what competitors are doing. The most popular sources of information are what employees themselves can find on the Internet, regularly available magazines, newsletters and online videos. Research is often viewed as the responsibility of every employee and the integration of all the different employee interests can lead to diverse results. Some of the companies have dedicated IT departments, but the trifling personnel size of most SMEs appears to be the main reason for leaving the responsibility of research with employees. Suppliers are a good source of information, as is listening to the requirements of clients. Two of the companies have very successful incentive programmes with which they reward their employees for presenting winning ideas, giving them salary increases and other bonuses (Company I, J). Company J said that many mobility ideas have been generated through these incentive programmes.

Unfortunately, as validated in previous literature, the level of research conducted by the companies interviewed was still at a very basic and naive level. Day (1994) has noted that most firms will perform a teardown analysis on the products of competitors and infrequently they might study the more discreet functionalities of competitors to improve their own activities. Bharati and Chaudhury (2012) determined that SMEs are all very aware of the actions of competitors and once an SME adopts a new technology, professional networks efficiently disseminate the knowledge and ensure assimilation throughout the particular industry. However, the highly successful market-driven firms are less short-sighted and studies the attitudes, values and management processes of the firms that have advanced to a peerless status (Day 1994).

Implementing unique and innovative mobile work procedures

The ability to invent and implement unique mobile work procedures is a dynamic capability that will create an advantage over competitors. The results from the interviews agreed with this reflection of Lawson & Samson (2001:389):

> *"The most innovative companies seek to be 'the best of the best'. Their employees have clarity of purpose and issue a challenge to find totally new ways of doing things in order to achieve the goal. For these companies, innovation is more than benchmarking. They do not try to simply succeed by matching others. Instead, they create a vision, a target which if achieved will create products that outperform and provide a distinct market position."*

Innovative mobile work procedures have dramatically decreased the product life cycles of company J in the last decade. Product life cycles used to stretch between seven to 10 years, but now due to mobility, it has decreased to two years and occasionally, even between six months to a year. Other examples are achieved as a result of the pervasiveness of mobility. For example, mobility has enabled anytime, anywhere work procedures, which means that employees often conduct a majority of their work away from the office. Successful firms, like the ones interviewed, have evolved from the conventional 'seeing-is-believing' methods of managing employee performance, to an output-based method of managing performance. They have even established a link between earning potential and output (Company G, I, J). Company J also realised the value of mobile technology when they equipped each member of their enormous sales force with a tablet. From this device they can access all company systems and immediately process new sales. The tablets have provided their salesmen with a quick and efficient way to access up-to-date information on stock availability, price, and substitute products if a product happens to be out of stock. It has also enhanced their status and appeal among clients.

Another innovative mobile work procedure is the utilisation of the GPS function on mobile devices (Company B, F, J). Company B uses it to track employees so that they can send specific callouts to the engineer who is closest to the client, thus saving on the cost of long-distance travelling. Company J uses the GPS functionality to plot the exact times clients were visited. From this data they can derive a lot of information: they analyse the effectiveness of their salesmen and decide which sales personnel require more training. They also use it to determine which clients need more attention. Company J is persistent in correctly mining their data for any advantage it might unlock. "*Data nowadays in companies are literally worth gold. Everybody is trying to get their hands on your data. Your data, at the end of the day, if you mine it correctly, is a massive asset to your company. The companies that understand the value of the database and using it effectively are the companies that are growing*" (Company J).

The convenience of communication has significantly improved the speed of information sharing and it has provided managers with a way to make prompt decisions (Company J). Mobile messaging also presents companies with the opportunity to save costs on phone calls (Company B, C, J). According to Company J, they have literally saved hundreds of thousands of rands on phone calls due to the much more affordable mobile messaging. Now, a sales manager can contact the

entire sales force simultaneously to deliver instructions, when before, it was necessary to either call each person individually, or to have regular corporate meetings.

Utilising mobile ICT with inimitable processes

This is a dynamic capability that has been discovered, in previous literature, to be necessary for the successful adoption and sustained profitable usage of information systems and technology (Caldeira & Ward 2003). It must be impossible for competitors to imitate or replicate the resource with perfect precision (Barney 1991). This can be accomplished if: a) the resource is difficult to acquire, b) the relationship between the capability and competitive advantage is ambiguous, or c) the capability depends on socially complex processes (Caldeira & Ward 2003). Company J has custom developed many mobile applications and technologies that will be difficult to copy. However, it is proven that with time any mobile technology architectures are vulnerable to being copied, replicated or at the very least substituted. The likelihood of competitors copying the actual technologies is in actual fact a certainty, because it is easy to acquire the technologies. The only way for a company to distinguish itself from competitors, lies in the efficiency in which the technology is utilised (Company B, C). Another variable that is difficult to copy is reputation. Technology plays a secondary role of enablement for the company to forge a reputation of reliability, integrity and dependability (Company C, H, I). The value of this DC lies with how the technology is exploited by the company and how socially complex these procedures are (Wade & Hulland 2004).

In addition, Company D believes that their ability to use mobile technologies to swiftly respond to client requests provides them with an advantage that will be difficult for competitors to replicate in the near future. However, simply encouraging the urgency for quick response times in staff does not seem to be a bulwark against the threat of replication. On the other hand, if one considers the sound reputation that company D has nurtured over the years as a company that places such a high value on client requests, then it will be difficult for competitors to play catch-up.

Company F is the only company in South Africa that designs and builds a specific software system that rivals the existing applications that are developed by powerful international conglomerates. In this treacherous environment, company F has cultivated a dynamic capability that is difficult to copy. They are efficiently using mobile ICT to communicate with clients and to respond to their specific product requirements. This capability is effective in sculpting a moderately sustainable competitive advantage because the larger size of the international competitors limits their ability to make one-to-one contact with clients, as they have to rely on third party distributors and dealers to sell their products in every country.

In the end, no capability is future proof and even obscure processes can eventually be copied by competitors. However, as company J puts it: the first-mover advantage that such capabilities provide a company makes it very difficult for competitors to catch up. The temporary advantages can place a company in a strong position to effectively compete and it would provide a head start over competitors (Company J). This corresponds with the opinion of Eisenhardt & Martin (2000) that the opportunity for competitive advantage is achieved by applying DCs earlier and more shrewdly than competing companies.

Company values that complement the inherent qualities in mobility

This capability refers to the compatibility between the inherent characteristics of mobility and the 'existing structural and non-structural characteristics' related to the values of the firm (Basole 2007:[7]). Any IT dynamic capability flourishes in a climate that welcomes and supports change and experimentation, reduces the fear of failure and welcomes opportunities to adopt new IT developments. IT resources require the nourishment of a culture of trusting and open relationships with minimum formal observances and officialdom (Powell & Dent-Micallef 1997). High-performance, innovative firms purposefully break down any separating barriers and instead, create horizontal organisational structures (Lawson & Samson 2001). Nine of the ten companies interviewed are such an organisation and they attribute it as a significant contributor to their success. These companies have horizontal interactions that stimulate open communication and the freedom to communicate with leadership (Company A, D, E, I, J). Communication remains an enormous challenge, especially to any large organisation, but mobility is a significant enabler to the development of a culture of quick communication and easy collaboration (Company J). Some of the companies stated that they have company values of integrity and that candidates applying for positions in the company are first judged on their integrity before they are accepted (Company B, F, H). To divert from the subject of mobility for a moment, it is interesting to note that, according to company H, electronic methods of communication is not absolutely sufficient for judging someone's character. Face-to-face meetings are still required to make effective character judgements.

At first glance it might not be evident what mobile ICT has in common with company values. However, the company values are imminently important in making mobility prosper. As noticed during the interviews, it is a difficult task to amend values and companies that already have a compliant temperament towards open relationships, teamwork, quick decision-making or a few hierarchical barriers, will have a more fortunate journey in finding success with mobility. It is also a massive advantage towards progression of mobile transformation to have a culture that is open minded about technology – one that finds it necessary to pursue a position at the forefront of technological innovation (Company C, G, I, J). Company values with a high tolerance for ambiguity find it easier to be innovative (Lawson & Samson 2001).

One of the most successful methods in developing an open innovative culture is to invest in people. To hire new employees and to nurture existing employees who have tendencies towards research and innovation (Lawson & Samson 2001). Company I and J purposefully cultivated the development of a technologically sophisticated culture by promoting healthy competition among employees in the form of incentive programmes that encourage personnel to be innovative and creative. It was also stated that a family orientated culture of respect, camaraderie, lenience and trust significantly improves the freedom of communication (Company C, H).

5.3.2 Practices influencing the development of dynamic capabilities

The second objective of this project was to identify what practices, necessary to develop and maintain these mobile DCs, are both effective and frequently observed across the SMEs. The frequent observation of excellent practices can constitute the start of a benchmark in mobility deployment. Table 8 identifies the common practices adopted by the interviewed SMEs in developing the identified capabilities and stipulates the frequency in which they occurred across the firms. It was noticed that a number of practices were commonly performed by the SMEs studied. The frequency of these practices and the positive reflections provided by the interviewees regarding them, suggest that they can be the beginning of a 'best practice' approach to mobile transformation.

Table 8: Practices influencing dynamic capabilities (Table format adapted from Daniel & Wilson 2003:291)

Practices	Observance in the interviews	Examples from cases
Keeping abreast of mobility trends	C, F, G, I, J	"*Since 1997 when we became a mobile technology provider we had to change our business practices so that we would set an example of how mobile technologies should be used. So, this has forced us to become truly mobile in our work procedures*" (Company I).
The importance of security	A, B, C, D, H, I, J	"*We have worked very hard to be where we are and we do not want to give that away to anyone to replicate*" (Company C).
Exploiting mobile ICT to increase productivity	B, E, I, J	"*We have also sped up the entire process of completing sales because the salesmen can execute an order while he sitting with the customer. By the time that a salesman leaves the location of the customer, the order has already been sent to the warehouse and the products have started the process of dispatchment. The advantage of that for us as a company is that the quicker you get your product on the shelf where it sells the more products we will shift. In that way mobile has given us the opportunity to streamline*

		and speed up that entire process, which we could not do in the past" (Company J)

Keeping abreast of mobility trends

Some of the SMEs interviewed have a business strategy to stay ahead of the mobile trend (Company F, G, I). Their purpose is to improve products and increase the functionality of services with the latest mobile technologies, so that they can be set apart from the competition. The mobility trends in the market definitely determine the strategic planning and approaches taken by company I. They put in great effort to define the market according to innovative mobile ICT usage and to improve awareness of the benefits of the new technologies. All of their mobile successes are shared with their business clients in an attempt to educate them and uplift their businesses. Other companies are far more conscientious and cautious in adopting new innovations. They remain knowledgeable about progression in the fluctuating mobile market and they will make an effort to research new innovations, but they only adopt a technology that will complement and facilitate their business objectives (Company H, F).

Keeping abreast of the mobility trends is an essential factor that will ensure that the mobile DCs remain up-to-date and effective.

The importance of security

Mobility has transformed company interfaces and it is now necessary to urgently consider all the new access points through which a malicious hacker or a contentious competitor can harm the company (Zetie 2005). Most of the companies interviewed agree that this is a top priority. Although it is an unusual luxury for SMEs to have dedicated IT security departments, companies C, H and J do. "*Data nowadays in companies is literally worth gold*" (Company J) and these three companies do not spare any effort or expense to protect their data. They have security policies in place that limit and control the type of information stored and accessed by mobile devices according to employee level. These policies allow management greater access to information. Every remote connection that is created by a mobile device is closely monitored and recorded in meticulous detail by company C: "*Every connection has a stamp on it, so you see who logs in and from where*" (Company C). Company H is a regulated company and they have contracts with defence forces, therefore, the need for protection against industrial espionage and national security threats requires them to utilise only the best innovations in mobile ICT security. They have strong security protocols that limit the functionality on mobile technologies, especially when travelling to certain at-risk countries. They also do regular penetration testing to identify any methods a hacker might use to harm them.

Most of the companies interviewed use firewalls, password protection, data encryption and antiviruses. Thanks to the effectiveness of security applications, viruses are no longer the biggest threat that SMEs face. Currently, malware causes 70% of incidents and is considered much more dangerous than viruses (Company B).

Mobile technologies, particularly mobile phones, contain a lot of valuable information. Some of the more conscientious companies interviewed have antitheft security applications that can remotely wipe the memory of a stolen mobile phone or change the BIOS information so that the phone cannot be 'turned on'. Some advanced systems can even track the phone with GPS (Company B, H).

Efficiently applying mobile security is a practice that will not be optional in the near future. It is a necessary factor in the advancement of mobile capabilities. It has been influential in the transformation in seven of the companies interviewed, because it has forced them to expand their scope and consider the holistic picture of the security of their information (Company A, B, C, D, H, I, J). Mobility has forced them to implement drastic measures to ensure the protection of their corporate property.

Exploiting mobile ICT to increase productivity

The factor of 'exploiting mobile ICT to increase productivity' does not have a similar comparative and any resource-based view in the IT literature. This capability involves the company's ability to leverage and combine resources with mobility to increase productivity in different sections of the organisation. It is a valuable achievement because it not only enables the integration of advances in many other fields, but also has a direct influence on performance.

All the companies interviewed said that mobile ICT has increased productivity at many levels in the business. According to company I, their mobility has significantly improved productivity, and improved productivity provides better service, and better service builds client trust. Mobility has also increased the speed of communication and effectively brings decision-making opportunities to managers along diminutive channels. It therefore increasing the rate at which decisions can be made (Company J). Mobility has also enabled anytime, anywhere work procedures that have increased the productivity of personnel. Company B also has a client relationship manager (CRM) application that can be accessed with any mobile device by salesmen and engineers alike. Thus, any procedures that require client management can be completed from any remote location, instead of being postponed until the employee is back in the office. Other companies have also built networks that enable mobile devices to access corporate systems (Company C, F, J).

The ability of company B to track engineers has been an enormous boost to their

productivity because they now always know how to locate their employees and they also have the capability to send call-out requests to the engineer who is closest to the client. Another example of increased productivity comes from company E: their sound engineer is able to control the entire sound desk from a tablet. On occasion, he can even manage two events simultaneously. This capability enables the engineer to move around in the venue and personally adjust the sound configurations on the tablet according to the acoustics. In a similar achievement, company E has also enabled the musicians to use tablets to manage their own monitors while they are on stage and during sound checks, thus improving their productivity.

Most of the companies use mobile devices to access e-mail systems. The interviewee from company I indicated that he is now able to respond to important e-mails even while he is on leave. The ability to access corporate e-mail systems provides valuable improvements to the productivity of the companies interviewed, but it is not a service that is rare in any industry and consequently, it does not contribute to the development of DCs.

5.3.3 Mobile transformation observed in the interviews

Mobility offers such amalgamating resources that if it is utilised to its full advantage, it will fundamentally transform a firm into a superior working entity (Basole & Rouse 2007). The reviewed literature explored four incremental categories of mobile transformation, described in section *2.3.2 Mobile transformation*. A short iteration of the four phases is provided below:

- **Mobilisation –** refers to an organisation that has made all of its data and processes available wirelessly, so that it can be accessed from any mobile device at ‘anytime, anywhere’ (Basole 2005b).
- **Enhancement –** refers to a reengineering of the firm’s processes according to the advantages benefited through mobility (Basole 2005b).
- **Reshaping –** Reshaping is a progressive phase in which mobility has become an integral part of the business’ strategy for competitive advantage (Basole 2005b).
- **Redefinition –** refers to the final phase in mobile transformation. A firm in this phase deploys mobile strategies with such influence that it redefines entire industrial markets (Basole 2005b; Scornavacca & Barnes 2008).

All of the SMEs interviewed have experienced a certain level of mobile transformation. The interviewees themselves gave testament regarding the maturity and advancement of mobile transformation in their companies. Question five in the interviews required the interviewees to expand on this concept. Question five was subdivided into three separate questions. Firstly, the interviewees were required to

describe their mobile maturity in terms of transformation experienced in the business practices and procedures. Secondly, they had to provide any information about attempts made to re-evaluate and re-orientate conventional activities and procedures to adopt mobile work practices or to gain leverage from its advantages. Finally, they had to discuss whether mobility has provided any increase in teamwork across conventional organisational boundaries.

The answers provided to these questions, as well as the researcher's holistic analysis regarding what has been learnt about the company after considering the findings of each interview in its entirety, are discussed in the following section. The rankings provided are subjectively calculated according to the answers provided by the interviewees to the three subcategories of question five and the qualitative data analysis conducted by the researcher from an interpretive perspective. The effectiveness of mobile DCs implemented in each company also formed part of this deliberation.

The transformation achievements of each company is analysed and ranked according to the four transformation categories. These categories provide a way to distinguish how successful mobile ICT has being utilised in each company. The more sophisticated the mobile transformation is in each of the companies, the more importance can be derived from the research findings regarding the transformational effect of the mobile DCs.

Company A

Company A is a small, but high-achieving company. It has implemented innovative mobile systems. However, its work processes remain mostly static and conventional. Only the manager experiences the full freedom of mobility to access and conduct his work from anywhere, anytime. The rest of the staff is still deskbound. However, its clients greatly benefit from the convenience that two large-scale mobile developments have afforded them. One of these systems is a mobile resident access system that is truly unique in its usability and efficiency.

The effect of mobile transformation is evident in the small company, but it has not progressed further than the category of mobilisation. Its dormancy could be due to its stable market. This residential estate management company competes on reputation alone and not on market share. This unique environment did not incite complacency in the company, but it completely eliminated their sense of urgency.

As presented in Table 7, company A adopted a number of DCs, which should have had a more significant impact in transforming the company. However, the stable environment has in some ways crippled their sophistication in applying those capabilities. The progress in mobility that the company has made thus far can be

contributed to the high levels of motivation in the directors towards technological advancement. That in itself is a worthy mobile DC, which can be effective in transforming a company.

Company B

Company B is a highly competitive company that operates in a turbulent market. The majority of employees practice excellent mobile work procedures out of necessity to remain competitive. All of the company's data and work procedures are location independent. Advancements in mobile telephony and GPS tracking functionalities conserve company time and money. The company is locked in an arduous wrestling match against numerous opponents, for a pittance of market share. The compelling conditions have forced company B to be technologically innovative. Mobile DCs have provided them with heterogeneous methods of increasing their competitive advantage, but the fluctuating environmental conditions cause these advantages to be temporary and hard-won. However, their dedicated efforts are effective because the accumulation of many temporary advantages achieved back-to-back is believed, by some researchers, to be the only real way in which DCs can achieve a sustainable competitive advantage (Eisenhardt & Martin 2000).

The dynamic market in which company B operates has been a crucible that forged a sharp technological edge. The transformation category in which this company is ranked is the category of reshaping. This company appropriates seven of the eight DCs presented in Table 7. The managing director specified that they are too small to exercise formal strategic planning, but it is clear that mobility has claimed a considerable portion of the company's tacit strategic actions. They make deliberate attempts to re-evaluate and redefine conventional activities and procedures to adopt mobile work practices or to gain leverage from its advantages.

The company's approach to strategy is not solely due to personnel size. Even the best formal and analytical strategy development procedures become ineffective when the object is the impossible task of attempting to predict stable outcomes in a turbulent environment (Mintzberg 1978). However, the framework of DCs is an excellent method of continuing strategic influence in market turbulence and it is empirically proven that it can maintain a competitive advantage (Jarvenpaa & Leidner 1998; Teece et al. 2007). It is normal for companies in turbulent markets to develop DCs in a more emergent way (Daniel & Wilson 2003). 'Fire fighting' might be an imperative operating procedure, but, as is the case with company B, as long as the innovative decision-making originates from a foundation of patterned and practised performance, then it will conform to the higher strategic purpose of the company's vision (Winter 2002). After all, an emergent strategy can be achieved through an "*unintended pattern in a stream of decisions*" (Mintzberg 1978:935).

Company C

Company C is a highly successful, award-winning SME and their technological sophistication is partially responsible for their accomplishments. They are an Internet service provider (ISP) and consequently, technological advancement is the bread-and-butter of this company. This includes very efficient and widespread adoptions in mobility. The interviewee avidly exerted that they have been completely transformed through mobility: "... *[We can] work from anywhere in the world and be connected to our office. I can sit anywhere with my laptop, even using a virtual phone and nobody would even know that I'm not in the* office" (Company C).

Although the ISP environment is normally categorised as highly turbulent and competitive, company C has cultivated a specific niche in ISP delivery and IT security management for residential estates and business office parks. This market portion is more stable and the level of influence exerted by company C has elevated them to an unrivalled position. The stable environment has not pacified them into a state of dormancy. Instead, they are rapidly expanding in the less turbulent market conditions, which enable them to progress with more certain, predictable steps. The hunger to be at the forefront of technological advancement is driven and maintained by the DCs of top management's commitment and a unified company mentality of striving to be the best. Mobile work procedures permeate every part of the company's operations to such an extent that it has almost become ubiquitous in completing work procedures. They are committed to re-evaluating and re-orientating conventional activities and procedures to adopt mobile work practices or to gain leverage from its advantages. "*We are regularly looking at ways to improve the way in which we interact with our customers, bringing in new services and rebuilding old areas*" (Company C). Mobility has affected an exceptionally mature mobile transformation and it can be categorised according to the transformational level of reshaping.

Company C effectively deploys all eight of the mobile DCs. As with company B, company C also does not commit time and resources to formal strategic planning, as is regularly the case with SMEs (Blili & Raymond 1993; Dyerson et al. 2009; Ghobakhloo et al. 2012). Even though they mainly execute decisions rapidly, they are not reckless. It is clear that they share a unified vision and a foundational knowledge base of technological excellence. They operate within the boundaries of their business objectives with emergent and tacit strategic purpose. Any opportunity for advancement in mobility is measured according to its value to the business model. The interviewed candidate does not ascribe their success to the direct influence of mobility. This is understandable because the mobile technologies cannot achieve inimitable competitive success on their own. It is the combination of mobility with organisational and human resources that creates the eight DCs that are influential in this company's success. Mobile ICT is so ingrained in their procedures

that its role in the business model has become standard.

Company D

Company D has a complacent nature and consequently, it is only moderately mature in mobility. Mobility has enabled location independence for the sales force, which generally spends four days of the week away from the office, but the rest of the personnel are bound to conventional work procedures. This company is in the first phase of mobile ICT development, which usually consists of wireless e-mail, contacts and calendars (Zetie 2005). The moderate mobile transformation consists of minor achievements in mobilising the organisation's data and processes, consequently cataloguing company D according to the first transformational level of mobilisation.

Company D has a meagre collection of mobile DCs. They only exercise three of the eight capabilities. The strongest of which are company values that complements the inherent qualities in mobility. They have a family-oriented culture with free and open communication and no vertical hierarchical structures. This can form a fertile foundation if they can be roused from their dormancy. The dormancy of this company seems to be largely caused by the indifference of top management towards valuable developments in mobile ICT. A paucity of financial resources also inhibits any suggestions from personnel regarding mobile progression.

Company E

Company E is different from the other SMEs interviewed. It is a non-profit organisation with the purpose to serve the community. Their mobile work procedures enables personnel to work from anywhere in the country. The utilisation of tablets by sound engineers and musicians has greatly improved productivity. However, although the way in which mobile technology is utilised in this vastly different industry can enrich the applicability of the mobile DCs identified in the study, it turned out that this organisation did not offer a valuable contribution. The interview with the candidate was also the least successful interaction, since the candidate was unable to expand on the mechanics of mobile work procedures. His area of expertise glued him too tightly to the engineering aspects of mobile ICT and the researcher did not succeed in broadening his view of mobile ICT to embrace its holistic influence. However, an interpretive paradigm approach to analysing this candidate's interview can still provide constructive insights.

Company E can be categorised according to the transformational level of enhancement, because its innovative utilisation of tablets has inadvertently led to the development of new processes that embrace mobility's value proposition. This can

be attributed to the influence of two DCs: a commitment to research new mobile technologies and an enthusiastic commitment to mobility from top management. Regular meetings with department leaders provide a platform to discuss and plan for technological improvements. These meetings indicate that company E has the potential to develop the influence of mobility from a strategic perspective.

Company F

Company F is an enterprising company with an exceptionally mature mobile model. The transformational level that company F is categorised in is reshaping. Data and processes are all available along mobile channels to enable anytime, anywhere work practices for most of the employees. They have even successfully integrated mobile support channels into their client service systems. Company F has been a superb candidate for the study since they have implemented every one of the eight mobile DCs. Their business has been completely transformed by mobility and it is now reengineering the way in which they compete. Their business model has been adapted according to the advantages available in mobility. For example, they have implemented a service model, which uses mobile ICT among other interactive channels that cannot easily be copied by their competitors. Their service model has certain sureties against replication. Their competitors are all international conglomerates who retail their products in South Africa via third party distributors and consequently, they do not have a direct interaction with their clients. This has distanced them from the product improvements required by their clients and it has built too many boundaries that prevent clients from receiving timely assistance when needed. On the contrary, company F prides itself on their close client relations and they have implemented many different applications and systems, including mobile functionalities, to increase their effectiveness in client service. Undoubtedly, since company F cannot compete directly with the enormous economic power and influence that the large international competitors have on the industry, they have been compelled to outwit their competitors in areas where their service or product is weak.

Enormous effort is expended to integrate mobility into the overall goals, strategies and strategic planning in this SME. It is an excellent example of how mobility can fundamentally reshape a business at a strategic level and provide it with a surprisingly sustainable competitive advantage. It is certain that a large portion of their success is shaped by the DCs of strong, determined leadership and hard-working company values. Undoubtedly, these capabilities have prepared the company for prosperous mobile procedures.

Company G

Company G is a small but enterprising architectural company. High levels of IT competency and motivated, creative management have provided them with a mature approach to using mobile ICT. They are categorised according to the transformational level of enhancement. Their data and processes are accessible through mobile devices and all their employees use it with efficient results. They have also started to benefit from the unique value proposition available in mobility. They have even cultivated a reputation of distinguishability and they are instantly recognised at construction sites as the architects with the tablets.

Even though they are using mobile ICT effectively, they have developed five of the eight mobile DCs and they make constant efforts to integrate mobility into their strategic planning, they still seem to have a blind spot for some of the necessary requirements in mobile business. The highly turbulent environment has led to emergent and experimental mobile strategy development, but it has created a deficiency in mobile practices. For instance, they have not made any efforts to secure either their mobile networks or to protect their mobile devices against theft or negligence. Company G is at risk against malicious threats to their business. They are a good example of a company that has recognised the benefits of mobile ICT and swiftly integrated it into their work procedures, but without calculating the risk of exposure. It could be that they do not realise the importance of mobile data security because they do not have any dedicated IT personnel. The lack of security measures is a negative influence on the mobile transformation achieved by company G, and they will be endangering themselves by attempting further transformational advancement without first addressing the issue of security.

Even though the candidate considers their mobile transformation to be subtle, the researcher suspects that they have allowed their business strategy to be influenced by the functionalities of technology instead of firmly steering technological investments according to prudent business strategies. Unlike most SMEs, they do have disposable income to experiment not only in mobility, but also in many other technologies. For instance, they bought a 3-D printer that is not being utilised because they have not truly considered its utility in their business. Recklessly expanding in mobile transformation without a strategic vision to stay united with their business model can become a dangerous indulgence for them. Not only can it be a wasteful expenditure, but it is a risk to their information systems and the security of confidential company information.

Company H

Company H is an advanced scientific and manufacturing company. They are a truly global operator with prominent clients from all over the world in defence forces and space aviation. Their global presence has required them to make significant investments in technology, which increases collaboration and virtual teamwork. A

large portion of these investments were in mobile ICT. Unlike company G's situation, company H has not bent to the temptation of yielding to technological trends. Instead, they are shrewd in applying their business strategy towards mobile ICT investments. Their top management is extremely mobile and they use mobility to enable location-independent productivity. Of the ten candidates interviewed, they have expended the most efforts on mobile data security and they have dedicated IT security personnel. Company H is progressive and sophisticated in mobility and mobile ICT has enabled, rather than directed, them to a transformational level of reshaping. Mobility is an important part of this company's competitive advantage and it has become indispensable to the business strategy, reshaping and reordering business processes.

The interviewee regards mobile ICT as being instrumental in enabling Company H to achieve competitive advantage. He also attributed the achievement of strategic advantages to mobility: "*Mobile het vir ons strategiese voordele* gebring" ("*Mobile has brought us strategic advantages"* (Company H)).

Company I

Company I retails in mobile ICT and accordingly, their strategic purpose is to be an archetype of its utilisation and value proposition. Their competitive existence relies completely on their efficiency at exploiting mobile ICT and how widely they can proclaim their successes. The processes practiced by personnel are both shaped and enabled by mobility and the technology permits them to function at complete efficiency from any location. "*We can move to any place, at any time and still function at 100%"* (Company I). Company I is defined in the transformation category of reshaping because their business strategy progressively pursues to be leaders of the mobility trend.

Company I is experienced in mobility and it efficiently practices seven of the eight mobile DCs. They have achieved success due to the unification of mobile capabilities and business strategy. They also have managerial leadership with a healthy appetite for new mobility trends. Their management will be among the first to discover new products and then they will search for people to effectively execute their ideas. Mobility is also complemented by their culture value of open communication.

Company J

Company J was the most mature in mobility of all the SMEs interviewed. "*Our whole business, at this stage, is probably 89% mobile and we are busy working now to get it fully mobile by the end of the financial year*" (Company J). This is the only SME

that can be categorised at the transformational level of redefinition. Company J has advanced further than any of the other SMEs interviewed. They are executing business strategies with essential dependence on mobility. They are creating entirely new ways of conducting business in their industry. Mobility has improved their managerial structures, as well as methods for managing personnel and interfaces with clients. It has transformed the business to become decentralised and it has significantly improved their operating interactions.

Company J implemented every one of the eight mobile DCs. It is a remarkable model of what can be achieved through mobility. The dynamic capability that undoubtedly had the greatest influence in their success is the industrious, vibrant leadership of their CEO.

Company J has orchestrated all of their enhancements in mobility internally because, according to them, there is a shortcoming in the market when it comes to mobile ICT support. "*There is quite a big gap in the market regarding mobile advisers. There are really not too many companies that provide this type of information. So, to get information is quite difficult*" (Company J). It is not certain how diligently they sought support from the big IT service providers, but it raises an interesting opinion. The sophistication of company J's mobile success certainly makes the probability of that statement possible. Further research can be conducted on the real value in mobility received from IT service providers in South Africa.

5.3.4 Combination of findings

All the findings in this chapter, chapter 5, are combined in a single table, Table 9, to improve the contextual understanding and to provide a holistic view of the findings. The first eight vertical rows list the combined dynamic capabilities from section *5.3.1 Mobile dynamic capabilities.* The following three rows list the combined practices from section *5.3.2 Practices influencing the development of dynamic capabilities.* The final rows list the combined information concerning the mobile transformation categories achieved by each firm, as discussed in section *5.3.3 Mobile transformation observed in the interviews*. The horizontal columns indicate the SMEs and a 'X' indicates which capabilities, practices or transformational achievements are performed in that company.

Table 9: Combination of findings

Category		Description	Company A	Company B	Company C	Company D	Company E	Company F	Company G	Company H	Company I	Company J
Mobile dynamic capabilities		Envisioning customer value	X	X	X			X			X	X
		Integrating mobility with the business strategy	X		X		X	X	X	X	X	X
		A visible commitment from top management	X	X	X		X	X	X		X	X
		High IT competency levels in employees		X	X		X		X	X	X	X
		A commitment to regularly research mobility	X	X	X	X	X	X	X		X	X
		Implementing unique and inventive mobile work procedures		X	X			X		X		X
		Utilising mobile ICT with inimitable processes	X	X	X	X		X	X		X	X
		Company values that complement the inherent qualities in mobility	X	X	X	X	X	X		X	X	X
Mobile practices		Keeping abreast with mobility trends			X			X	X		X	X
		The importance of security	X	X	X	X				X	X	X
		Exploiting mobile ICT to increase productivity		X			X				X	X
Mobile transformation	Mobility	Data and processes published in a mobile format	X	X	X	X	X	X	X	X	X	X
		Geographic and temporal independence	X	X	X	X	X	X	X	X	X	X
	Enhance-ment	A foundational redesign of processes and the development of new processes		X	X		X	X	X	X	X	X
		Radical changes in the business model		X	X		X	X	X	X	X	X
	Reshaping	Mobility is an important part of the firm's competitive advantage		X	X			X		X	X	X
		Mobility is essential in the business strategy		X	X			X		X	X	X
		Work practices are shaped by the functionalities of mobility		X	X			X		X	X	X
	Redefinition	Entirely new ways of doing business and the establishment of new capabilities and expertise										X
		Business strategies are shaped around mobility										X
		A redefinition of entire industrial markets										X

5.4 Concluding summary

A challenge experienced by the researcher during the interviews was that the participants struggled to describe mobile work procedures from an employee management perspective and to separate it from technology management or usage. This was particularly apparent when the interviewees were asked to answer questions 16 and 23 (see Annexure A). Both these questions specifically referenced mobile work procedures. A logical conclusion, which is consistent with the literature review, is that SMEs are much more focused on the piecemeal implementations of technology than the larger and more holistic focus of using technology for effective people management.

Nevertheless, the findings of this study still provided numerous and detailed results. This chapter presented the results from the interviews, along with a related analysis. It started with background information about each SME interviewed so that the reader understands the full context of each of the findings. It then identified eight mobile DCs, followed by a discussion of the common practices that developed and enhanced the DCs. Finally, the chapter discussed the progress in transformation that mobility has exercised on each of the companies interviewed. All the information of this chapter was combined into a single table (Table 9) to provide a holistic, contextual view of the findings.

The next chapter, Chapter 6 provides a discussion of the study's results. Firstly, it provides an analysis of each of the eight DCs identified, according to the necessary attributes required by the theory of DCs. Secondly, it provides guidelines for enterprising SMEs to direct their strategic use of mobile ICT.

Chapter 6 – Discussion of results

6.1 Introduction

Chapter 5 presented the research findings, which were the mobile dynamic capabilities (DCs) that enable SMEs to deploy mobile ICT with strategic intentions. The practices that make the capabilities effective were described and the comprehensive information regarding the mobile transformation achieved in each of the SMEs was discussed. All three of these factors were discussed as they appeared in the interview data. They were substantiated by previous literature when it was relevant and interpretive analysis was provided whenever it could add value to the interpretation or the understanding of the factors identified.

In chapter 4 – section *4.5.2 Analysis and interpretation of data*, the study discussed how the theory of DCs was used in the analysis of the data to identify the eight *mobile* DCs, of chapter 5 - Table 7. The study has not yet provided evidence to substantiate exactly how the mobile DCs satisfy the conditions stipulated in the theory. Chapter 6 delves deeper into the mechanics of the *mobile* DCs identified, to provide evidence for their compliance with the theory of DC. The chapter also presented the guidelines developed to guide SMEs in their strategic utilisation of mobile ICT. The chapter concluded with a conceptual framework that illustrates the guidelines and their relationships.

The purpose of this study was to ascertain the DCs across different industries to determine how mobile ICT can be strategically used by SMEs. The theory of DC instructs firms to acquire, create, improve or dispose of bundles of complementary resources that are effective to contribute to sustained competitive advantage (Teece & Pisano 1994). It provides a strategic approach to the utilisation of these bundles of resources. Therefore, the understanding of the effective usage and the attributes of DCs in SMEs provides an insight into purposeful and tacit strategic activity of the firm. As discovered by this study and presented in chapter 5, mobile ICT performs an enabling role as an effective resource in the DCs of the SMEs. The next section provides evidence to substantiate how mobility and other resources combine to develop DCs, according to the conditions required by the theory of DC.

6.2 Research results

6.2.1 Discussion of the mobile dynamic capabilities

The DCs are predicated on four underlying assertions (Barney 1991; Caldeira & Ward 2003; Mata et al. 1995; Wade & Hulland 2004):

- that the capabilities are valuable,

- that the resources and capabilities possessed by the firm are rare,
- that these resources and capabilities are imperfectly imitable, and
- that they are non-substitutionable.

According to the first assertion, it is required that a resource or a capability be valuable to enable the implementation of strategies that are advantageous (Caldeira & Ward 2003). Secondly, the theory of DCs also require the resource capability to be heterogeneous, as this can provide at least a first-mover advantage (Chen et al. 2010). The third condition of DC is for the resource or capability to be inimitable or imperfectly imitable. The firms that do not possess this resource will confront a cost or time disadvantage in developing or acquiring it and consequently, it will provide its owner with temporary advantages (Barney 1991).

Three reasons why a resource can be imperfectly imitable have been suggested (Barney 1991; Caldeira & Ward 2003; Mata et al. 1995):

1. unique historical conditions,
2. causal ambiguity, and
3. social complexity.

Unique historical conditions of a firm can prevent resources and capabilities from imitation by competitors – when the characteristics of the resource developed gradually over extended periods of time in the unique history of a firm.

Causal ambiguity exists when competitors cannot perfectly comprehend how a specific resource or capability contributes to the competitive advantage of a company.

Social complexity exists when the resources or capabilities are composed of the combined engagements of many different social entities (Caldeira & Ward 2003; Daniel & Wilson 2003).

The final condition required of a DC is for it to be non-substitutionable. No equivalent valuable resources that can commonly be used as a substitute should exist (Caldeira & Ward 2003). If all these conditions are met, then the resource can be defined as a DC and can contribute to a competitive advantage.

The DCs proposed by this study, as identified in Table 7, exhibit common features among the SMEs interviewed. The second column of Table 7 indicates how frequently the capabilities were observed in the interviews. Even though common features exist between the capabilities of different firms, they are still likely to be established, managed and implemented in dissimilar ways in the different SMEs. This is attributed to the idiosyncratic details of DCs. Accordingly, it is expected that

they will fulfil the condition of heterogeneity and therefore, at the very least, they can offer their firms first-mover advantages.

Researchers are required to provide sufficiently convincing evidence for their results (Hofstee 2006). The next section will discuss all the conditions necessary to define a DC and how they were applied to each of the capabilities identified in the study. Figure 6 (*4.5.2 Analysis and interpretation of data*) was used for this analysis. If a capability fully met each of the four conditions, then it was defined as a DC and listed in Table 7. Following, is the analysis of these eight DCs:

Envisioning client value

1. **Valuable** – This capability enables new value propositions to clients by adding value to products, processes and services through the functional attributes of mobility. These can include: mobility, localisation, personalisation and convenience. The increase of value propositions to the client will attract more clients and provide value to this capability.
2. **Rare** – Each firm is likely to execute and manage this capability in unique ways. Not one firm will apply mobility to their value propositions in exactly the same way. It is dependent on the respective goals and objectives in serving the client. Consequently, unique executions of this capability contribute to its rarity.
3. **Inimitable** – Using mobility to effectively improve products, services and processes, is usually developed progressively according to the historical experiences of firms. It is dependent on unique periods of time in the history of the SMEs. All of the firms interviewed started to use mobile ICT as soon as it became available. Those that are most successful at using it to provide value to clients have tinkered with the resource over a significant period of time. Successful deployments progressed to further levels of improvements through the years. "*Success breeds success*" (Company B).
   Envisioning client value is a capability that combines the functionality of IT systems, such as mobility, with social systems and processes. This increases the social complexity of the capability and makes it more difficult to imitate. Company F, for instance, provides valuable client service that cannot be imitated by their international competitors. Even though their competitors are powerful global conglomerates, they cannot successfully replicate the convenient and efficient communication procedures that a local developer, like company F, can offer the client.
4. **Non-substitutable** – There is no strategic equivalent capability that can provide a distinguished, valuable service to the client. Within this capability it is possible for two separate firms to follow different methods and still achieve similar outcomes of client value propositions. However, that does not substitute the capability of envisioning client value – it is only an execution of different methods to achieve the same capability. Mobility has enabled new

avenues for businesses to gain new clients and to deliver services that were previously impossible (Company C). Such results are not commonly substitutionable. There is nothing that can substitute mobility's role in this capability, to still provide a service that is as convenient, personalised or location independent.

According to the four conditions demanded by the theory of DC, envisioning client value can be defined as a true DC which provides the SMEs interviewed with competitive advantages. In the case of a company C, the competitive advantage proves to be more prominent. Wu and Hisa (2008) provide concurring evidence with a similar DC enabled by IT.

Integrating mobility with the business strategy

1. **Valuable** – Integrating mobility with the business strategy is undeniably a valuable resource that will provide the firm with a competitive advantage. Integrating mobility into strategic objectives will provide benefits like: greater client satisfaction, enterprise visibility into assets and resources and a higher return on investments (Basole 2007; Frost & Sullivan 2007; Zetie 2005).
2. **Rare** – This is certainly a rare resource among SMEs (Blili & Raymond 1993; Dyerson et al. 2009; Ghobakhloo et al. 2012). Each firm is likely to constitute, execute and manage the integration of mobility into the business strategy in a different way, which will contribute to the rarity of this capability.
3. **Inimitable** – The capability also appears to exhibit features of social complexity, causal ambiguity and historically dependent development. The fact that this capability was present in eight of the ten companies suggests that capable strategic development capabilities already occurred within those companies. The process of strategic development typically consists of a patterned collection of multiple small decisions and actions, both of an implicit and explicit nature, undertaken throughout the firm and reliant on earlier strategies and actions (Daniel & Wilson 2003; Mintzberg 1978). Consequently, to some extent, this capability possesses inimitability that can contribute towards a competitive advantage.
4. **Non-substitutable** – It is not possible to substitute the strategic advantage received from tautly coupling mobility with the business strategy. This is specifically true when mobility has exercised such a transformational effect on the business that it becomes indistinguishable from, and simultaneously interactive with the business strategy (Teo & King 1997).

A similar DC was identified by Daniel and Wilson (2003) regarding the transformational influence of e-business. Other similar DCs have also been

proposed regarding IT and business strategy (Koch 2010; Powell & Dent-Micallef 1997).

A visible commitment from top management

1. **Valuable** – A clear and visible managerial sponsorship of any IT (including mobile ICT) initiatives provide an important and valuable contribution towards obtaining competitive advantage (Bharadwaj et al. 1999).
2. **Rare** – IS managers will vary according to their individual IS experience and professional backgrounds. Consequently, it provides heterogeneity to the processes of the firm when these managers apply their commitment to mobile ICT innovations.
3. **Inimitable** – The influence of active commitment to mobility from top management is both historically dependent and socially complex. A firm with a history where their leaders exercises this type of influence will typically continue to sculpt favourable relationships between the commitment of managers and new technologies. The experiences gained by managers through the years will sharpen their skills and increase their effectiveness to favourably influence the adoption of new technologies. It is a socially complex issue because it involves unique skills and talents of a managerial team combined with organisational and physical resources (Barney 1991). It might also be exceptionally difficult to understand how a motivated and efficient managerial team influences a resource. Managerial talent, for example, will exercise a unique influence on the successful implementations of IS strategies (Caldeira & Ward 2003; Mata et al. 1995). The exact way in which managerial talent influences the resource is difficult to disassemble. Consequently, it will be very difficult to imitate or to replicate the influence of managerial talent.
4. **Non-substitutable** – Theoretically it should be possible to acquire the necessary expertise by attracting competent IS personnel or through arrangements with consultancy firms (Wade & Hulland 2004). This is an option for small SMEs to gain talented IS managers, but it is an exceptionally difficult task to use this approach to substitute resources that are shaped by the value received from experienced managers, who operate in socially complex and historically dependent environments. Sufficient knowledge about mobility is also not regularly available in the market and, therefore, the process of substitution is further complicated. According to company J, there is a debilitating deficiency in the market when it comes to mobile expertise.

Some researchers who have investigated the influence of IT on performance, have concluded that constructive ‘managerial IT skills’ is the only DC that can be empirically proved to influence sustained competitive advantage (Basole 2007;

Bharadwaj et al. 1999; Caldeira & Ward 2003; Mata et al. 1995). Five of the six SMEs interviewed that are regarded to be exceptionally mature in their mobile transformation, indicated that the clear and visible sponsorship from management significantly contributed to their success (Company B, C, F, G, I, J). This capability exercises a direct contribution to mobile transformation.

High IT competency levels in employees

1. **Valuable** – High levels of IT competency among employees will increase the successful adoption of mobility and positively contribute towards mobile transformation. Technological competency and end-user readiness is a valuable resource in mobile developments (Basole 2005a). The IT experience of employees can have a primary influence on successful implementations of mobility (Gorlenko & Merrick 2003). The familiarity and level of knowledge that managers have regarding mobile ICT also have an important impact on mobility adoption (Basole 2005a; Basole 2007).
2. **Rare** – The IT competency levels of personnel will vary in different firms based on the idiosyncratic nature of organisational structures and employees' skills or experience. Accordingly, the capability of IT competency levels will not be identical in any two firms. Regular training is an efficient way of increasing the distinction in the competency levels of personnel (Company J).
3. **Inimitable** – The way in which companies apply the IT competency levels that they have present is predominantly dependent on social structures and, therefore, it is difficult to imitate. Since the levels of IT competency also varies between the different companies, perfect imitation by competitors is improbable.
4. **Non-substitutable** – There is a risk that companies that lack in IT competency can substitute the required skills from consultants, who are available in the market. However, sustaining that expenditure over the long term would not be prudent or always possible.

The effectiveness of high IT competency levels to contribute towards successful adoption of information technologies is concurred by the results of Caldeira and Ward (2003).

A commitment to continuously research mobility

1. **Valuable** – A commitment to regularly investigate new advancements in mobile ICT will provide the firm with valuable opportunities to be innovative.
2. **Rare** – If an SME can encourage its entire personnel to participate in the

process of research, then the melding of different interests and expertise will promote the discovery of rare, creative and insightful ideas (Company F, I, J). "*The different perspectives make for an interesting blend of opinions*" (Company F).

3. **Inimitable** – This capability completes the condition of inimitability because it is a socially complex procedure. As mentioned before, research into new technologies is enhanced by the distinguishing backgrounds and relevant business or IT experience of those conducting the research. Some of the companies interviewed left the responsibility of research to every employee. However, if this is not assigned as an explicit part of every employee's key performance index, which is improbable, then the task will never be sufficiently conducted. The company would probably only receive mediocre and unoriginal ideas from employees when they are pressed or when they happen to stumble upon them. A slightly more efficient way is to appoint dedicated IT personnel, who carry the responsibility of new progressions in mobility. However, the method that delivers the most creative and innovative ideas is to encourage personnel to participate in idea generation through incentive programmes that will reward the employee with the winning idea with bonuses and salary increases (Company I, J). Research and innovation becomes more successful if management would sanction time, funding and facilities towards dedicated research and development (Lawson & Samson 2001).
4. **Non-substitutable** – The responsibility to conduct research into innovative mobile ideas can be outsourced to external consultants. However, once again, this is an expensive substitute that is not viable for long-term practice.

Understanding the implications of developments in IS, is an integrative capability. It provides firms with the capacity to utilise knowledge from external resources and incorporate it into the firm's technical know-how (Lawson & Samson 2001). Other researchers also enforce the correlation between IT-related research and the contribution to competitive advantage (Bharadwaj 2000; Day 1994; Koch 2010; Powell & Dent-Micallef 1997).

Implementing unique and inventive mobile work procedures

1. **Valuable** – Unique and inventive mobile work procedures can decrease product life cycles, enable mobile personnel performance management, decrease sales turnaround times, improve productivity, and enable effective collaboration.
2. **Rare** – The innovative SMEs interviewed issue a challenge to find completely new methods of implementing mobility that will distinguish them from competitors. They do not simply attempt to keep up with other companies, but

pursue the vision to outperform them and to achieve a distinct market position (Lawson & Samson 2001).

3. **Inimitable** – With time, it is possible to replicate any mobile work procedures. For example, many of the companies interviewed still believe that the anytime, anywhere work procedures enabled by mobility, provides a distinctive competitive advantage. However, the reality is that mobility has matured so much in pervasiveness, that it is unusual for a company not to utilise location and time-independent benefits. In contrast, there are many other valid mobile work procedures that remain unique and provide the company, at the very least, with a first-mover competitive advantage. The title of this capability specifically includes the phrase 'work procedures' because inventive mobile ICT can easily be imitated, but mobile *work procedures* involve social systems that are complex and it might be difficult to determine their influence on competitive advantage.
4. **Non-substitutable** – Theoretically, it should be possible for at least some of the work procedures in this category to be substitutionable by other types of processes, but it will be a resource-intensive endeavour to understand, develop and substitute the exact influences on competitive advantage. Consequently, at the very least, this capability should contribute towards temporary competitive advantages.

There are no examples and previous research with parallel empirical results, but Lawson and Samson (2001) proposed similar conclusions when describing how the most innovative companies seek to achieve results beyond the benchmark, by creating outstanding products that outclass competitors to achieve distinct competitive advantage.

Utilising mobile ICT with inimitable processes

1. **Valuable** – Combining mobile ICT with complementary processes to create IS resources that are difficult for competitors to copy or replicate, will provide value to the firm. Empirical evidence exists that IS resources are valuable, even when their potential is not fully realised (Bharadwaj 2000; Mata et al. 1995; Ross et al. 1996). The value of this capability does not depend on the technology, but on how it is exploited in the firm through valuable procedures.
2. **Rare** – The risk of competitors utilising the same mobile technologies is high if the focus is on the acquisition of technology alone. The only way for a company to distinguish itself from competitors, is in the efficiency in which the technology is utilised. For instance, a factor that achieves distinction is: if mobile ICT is combined with processes that contribute towards a positive reputation (Company B, F). A company's reputation is unique and difficult to copy or to imitate.

3. **Inimitable** – The perfect imitation of resources is complicated when the resources are deployed with innovative procedures that make it difficult to quantify how they promote competition (Wade & Hulland 2004; Caldeira & Ward 2003). Using mobile ICT to enable services that treat the client as king, will result in contributions to competitive advantage that are difficult to quantify and, therefore, difficult to imitate (Company C). Among the companies interviewed, it was found that utilising mobile ICT to swiftly respond to client requests provided an advantage over competitors (Company B, C, D, F). However, this advantage is only temporary and more likely to provide first-mover advantages, which are still valuable, but not completely inimitable.
4. **Non-substitutable** – Company F is a good example of an SME who investigated the weaknesses of competitors and then developed counter processes that can distinguish their company from the rest of the market. Mobile ICT contributes to a service model that their international competitors cannot imitate or substitute. Subsequently, they have achieved a more permanent competitive advantage.

IS infrastructure are simple to copy by competitors and consequently, it provides a fragile contribution to performance advantage (Company J). In contrast, there is substantial empirical evidence that information capabilities can contribute and sometimes even cause competitive advantage (Wade & Hulland 2004). In the end, anything can be copied, but when a company is the first in the market with new technologies, it becomes increasingly difficult for competitors to catch up (Company J). A string of consecutive capabilities that contribute to temporary competitive advantages are the most achievable method of creating value from DCs (Eisenhardt & Martin 2000).

Company values that complement the inherent qualities in mobility

1. **Valuable** – In the pursuit of mobile transformation, it is a valuable capability for firms to invest in the employees' values. Value can be achieved if they would focus on eliminating hierarchical structures of command and control (Sorensen 2004).
2. **Rare** – The conditions in which company values are developed and the methods in which they are managed or encouraged, is expected to vary between different firms. Consequently, it satisfies the condition of heterogeneity and can, at the very least, provide the firm with a first-mover advantage. A high tolerance for ambiguity is a rare value that will increase the firm's ability to manage new innovations (Lawson & Samson 2001).
3. **Inimitable** – The values and cultural orientation of a firm is a socially complex and historically dependent resource. It influences the firm's strategic preference as either an aggressor, a conservator or a balanced operator –

factors that evolve progressively in the history of a company (E-Business Strategies 2003).This capability has an influence on all resource bundles, which include human and organisational components. The full contribution that it exercises on competitive advantage will also be difficult to calculate and even more difficult to imitate.

4. **Non-substitutable** – The company values include: idiosyncratic strategic direction, corporate vision, employee interaction, operating methods, internal politics and organisational culture (Basole 2005a; Basole 2007).

To achieve high levels of mobile transformation, a firm should nurture company values that promote easy communication and enables horizontal decision making (Townsend et al. 1998). Powell and Dent-Micallef (1997) concur that any IT capability will flourish in a welcoming climate with values that encourage collaboration, experimentation and minimises the fear of failure.

The capabilities listed before fulfil all the required conditions of the DCs framework. They can be used to guide managers in pursuing a complete mobile transformation. DCs are a valid strategic alternative for small businesses that do not have the resources to conduct conventional strategic planning. The DCs identified will contribute towards strategic advantages and, at the very least, provide a temporary competitive advantage in both stable and turbulent environments.

The following sections will describe guidelines to direct managers in operationalising the findings of this study. It will include the DCs that are effective at achieving organisation-wide transformation, as well as the practices that are necessary for developing and maintaining the efficiency of these capabilities. Please note that the order in which the information is presented is not in sequential steps, and it should not be assumed that any particular guideline is bound to its ordering. Each of the points made in this guideline was discussed in chapter 4 and in the beginning of chapter 5. The aim in this section is to provide an operational summary that describes the actions required of SME managers to achieve mobile transformation. A framework is developed to illustrate and summarise the guidelines.

6.2.2 Guidelines to mobile transformation

Organisations must not only discover new ways of operation, but must integrate those new methods into its standard operating procedures, if they want to achieve a real transformation. Companies can experience a tension between the need to innovate and the need to sustain current operations. The DCs theory is expected to provide a partial solution to this tension (Daniel & Wilson 2003). It is suggested by previous authors that high velocity markets will demand capabilities to be simple, experiential and iterative (Eisenhardt & Martin 2000). It was noted in the interviews

that the companies with high-velocity markets implemented DCs that are tightly coupled with business strategy to maximise transformative opportunities. These companies also exhibited more freedom to experimentation according to a clear, direct vision. They also implemented more established practices for researching new technologies. With the exception of company H, the companies that have achieved the greatest mobile transformation, also experience rapidly changing environments. The findings of the study consequently suggest that transformational achievement is positively related to the influence exerted by the external environment.

6.2.2.1 Guidelines to develop mobile dynamic capabilities

1. **Integrate mobility with the business strategy** – The most important element to mobility is to always approach it from a strategic perspective. Formal, analytical strategic planning is not essential. Instead, the acquisition, development and maintenance of dynamic resources and the disposal of out-dated resources, is a viable strategic approach. It is evident from the outcomes of this study that the DCs identified will have a strong strategic influence on the firm to completely transform its business processes and rearrange them into a greater competitive entity. It must be recognised that mobility has the capacity to completely alter the strategy of a firm, perhaps in a radical way. It is strongly advised that a well-defined strategic vision is established. Equally, it is also strongly advised that the company should consider the role that mobility will play in the execution of its corporate mission. In turbulent markets, it is suggested that a) firms should move away from a planned, analytical mobility strategy towards procedures that allow a mobility strategy to develop in a more emergent way, while still being guided by a clear vision, b) that mobility should be tightly coupled with business strategy and c) that an allowance should be made for mobility to form an 'input' to the business strategy development process.
2. **Nurture company values that complement the inherent qualities in mobility** – Companies should invest economic and organisational resources into developing company values that will be compliant to the inherent values, which will make mobility prosperous. Cultural values that are: a) receptive to the change, b) can tolerate ambiguity, c) encourage open communication and c) value horizontal organisational structures, have greater success in the assimilation and prosperity of mobility. One way to cultivate sophisticated technological values is to establish incentive programmes that encourage personnel to be innovative.
3. **Envision client value** – DCs should be predicated with the purpose to increase the firm's value proposition. Most market-driven companies exhibit the capability to enhance their value-added services in their interactions with the client, their products or services. Mobility offers great features to increase

the value proposition. Advancements in location and time-independence, personalisation and convenience of interaction can all favourably influence the benefits experienced by the client.

4. **Establish a visible commitment from top management** – It is one of the most important capabilities for top management to exert a clear and visible commitment to mobility initiatives. Many researchers have provided empirical evidence that state that the IS resource that contributes the greatest influence on competitive advantage, is the managerial commitment of skilled managers (Bharadwaj et al. 1999; Caldeira & Ward 2003; Mata et al. 1995). The support of key managerial staff will promote the successful assembly of coherent bundles of resources, which includes mobile ICT resources. The SMEs interviewed concurred that the attitudes exercised by top management towards mobility, definitely sets the tone for the technological sophistication of the company. Without fail, the companies that progressed the furthest in mobile transformation also had very influential managers that drove the adoption of new technologies.
5. **Ensure high IT competency levels in employees** – Greater IT competency undoubtedly holds a positive correlation with mobile transformation. The companies with the greatest mobile maturity also had the highest levels of IT competency among its personnel. The two methods for achieving sophisticated IT employees are a) to appoint employees with sufficient IT skills or b) to increase the IT skills of existing personnel with relevant training and the implementation of programmes that aim to educate them. It is generally believed that SMEs do not possess the resources to send employees for IT training. However, it is learnt from the SMEs in the study that IT proficiency can also be advanced by methods that are less resource intensive. These methods include IS conferences and internal educational campaigns.
6. **Conduct continuous research on mobility** – This capability involves a devotion to regularly research and investigate new mobile technologies. Innovative companies exhibit a commitment to continually increase their knowledge. This capability is only primitively exercised if research in mobility is limited to observing the practices of competitors or studying the benchmarks in mobile enablement. Turbulent markets call for more established research procedures. Highly successful, market-driven firms do not settle for only replicating the technologies of competitors or other market equivalents, they focus on studying the attitudes, values and managerial processes of the firms that have progressed to a peerless status. Accordingly, it is good practice for SMEs to emulate the mobile values, mobile managerial procedures and the attitudes towards mobility that are exhibited by firms that have progressed to the highest possible mobile transformation.
7. **Implement unique and inventive mobile work procedures** – The capability to be innovative in mobility achieves noteworthy contributions towards competitive advantage and establishes distinguishability over competitors.

Innovative companies aim at being 'the best of the best'. Inventive mobile work procedures can dramatically decrease product life cycles and increase sales turnover. It can promote productivity with time and location-independent mobile work practices. Other methods in mobile innovation can improve employee performance management, client service, communication and the geographical influence of firm competitiveness. This capability can be achieved by a combination of: a) creating efficient channels to promote innovation among personnel, b) welcoming the influence of external consultants, c) committing resources to mobility research and development (even at an entry-level of functionality), and d) issuing a challenge to the company's vision or mission statement to develop unique and inventive methods of achieving business objectives.

8. **Utilise mobile ICT with inimitable processes** – There is a condition to all the DCs to acquire and develop rare and inimitable resources. However, depending on how mobile ICT is utilised, it can also be considered as a DC in its own right. Accordingly, it is advantageous to SMEs to utilise mobile ICT in combination with soft systems that cannot be copied with perfect precision. Any mobile architecture can be imitated, but it is possible for companies to distinguish themselves from competitors in the efficiency in which the technology is utilised. This can be accomplished: a) by establishing barriers that make specific mobile technologies difficult to acquire, b) if the relationship between mobile information systems and competitive advantage is ambiguous, or c) if mobility is combined with socially complex processes.

These guidelines will be depicted on the left of the conceptual framework – *Figure 10: Guidelines for the strategic utilisation of mobile ICT in SMEs*. They will be displayed as follows:

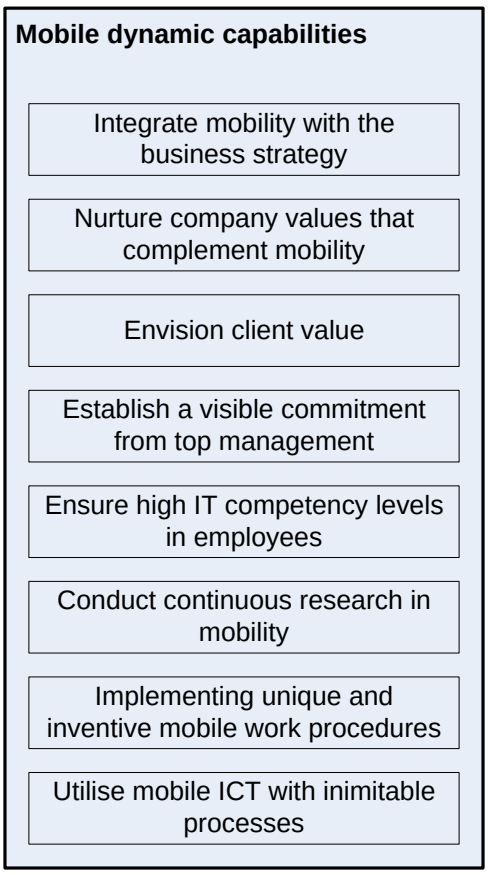

Figure 7: Guidelines toward mobile dynamic capabilities

6.2.2.2 Guidelines to practices that develop and maintain the effectiveness of mobile dynamic capabilities

The second objective of this project was to identify the practices that develop and maintain the effectiveness of the identified mobile DCs in Table 7. The knowledge learnt from these practices make a valuable contribution to the strategic capability of any company. The following section lists the guidelines derived from analysing the roles these capabilities fulfilled in the SMEs interviewed. These guidelines provide a summary that focus on assisting managers to develop or implement these practices. The practices and their occurrence in the interviews are listed in Table 8 and described in detail in section *5.3.2 Practices influencing the development of dynamic capabilities*. Once again, the following guidelines are presented in a numbered list, but this does not at all imply a logical order of their importance:

1. **Keep abreast of mobility trends** – It is advised that companies remain knowledgeable about the IS/IT progression in the turbulent mobile market. It is good practice for SMEs that aim to be innovative, to expend resources to research new mobile technologies, yet, to only adopt a technology that will complement and facilitate their business strategy.
2. **Invest in mobile security** – Mobility has opened many channels whereby

malicious persons or programmes can access or compromise company information. It is advised that mobile devices should be managed and secured just like personal computers are (Zetie 2005). A company can choose to manage security themselves or to outsource it to service providers. Of the companies interviewed, those that have a mature approach towards security, all agreed that security is a top priority and that company data should be jealously guarded. It is crucial for companies to comprehensively plan coping procedures for all the newly available technologies and services. Entry-level protection procedures include firewalls, password protection, data encryption, malware protection and antiviruses. It is also important to protect mobile devices with anti-theft security applications. The security of mobile ICT solutions should become a foundational factor of a mobility strategy (Forrester Research 2009; Zetie 2005). Applying efficient security measures is an essential factor for the advancement of mobile DCs. As the integration of mobile services increase in complexity, SMEs will need to focus efforts on improving security levels and security management (Passerini & Patten 2006).

3. **Exploit mobile ICT to increase productivity** – This factor can improve the overall efficiency of mobile DCs. It should be more sophisticated than only enabling wireless e-mail, contacts or calendar systems. It should focus on combining resources with mobile DCs to increase productivity at different levels in the organisation. For instance, it can improve the efficiency of after-sales services, it can increase the speed of communication or it can provide more convenient and swifter decision-making opportunities. Wireless access to back-office applications and intranet services will also improve the productivity of travelling personnel. There are many innovative opportunities for mobile ICT to contribute towards the development of more productive DCs.

The guidelines to the practices mentioned will be displayed at the bottom of the guidelines framework as follows:

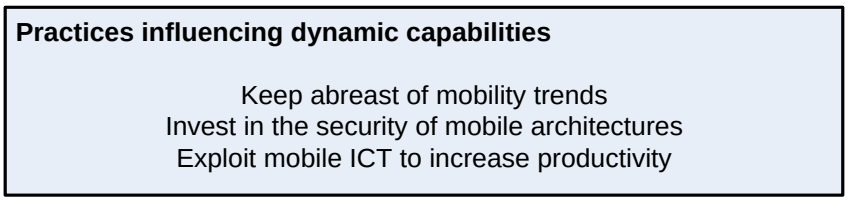

Figure 8: Guidelines to the practices influencing dynamic capabilities

6.2.2.3 Mobile transformation in the framework

If the two sets of guidelines previously discussed are appropriately developed in an SME, then it could completely transform the company into a mobile entity. The

different levels of transformation maturity are: mobilisation, enhancement, reshaping, or redefinition. Mobilisation is the lowest level and redefinition is the highest. The categories are described in detail in section *2.3.2 Mobile transformation* and in section 5*.3.3 Mobile transformation observed in the interviews.* The categories are displayed on the right of guidelines framework (Figure 10), illustrating the outcomes of an efficient strategic approach to mobility. The base of the triangle simulates the lowest transformational level and the highest point simulates the greatest transformational level. The sequential order of the levels is indicated with arrows.

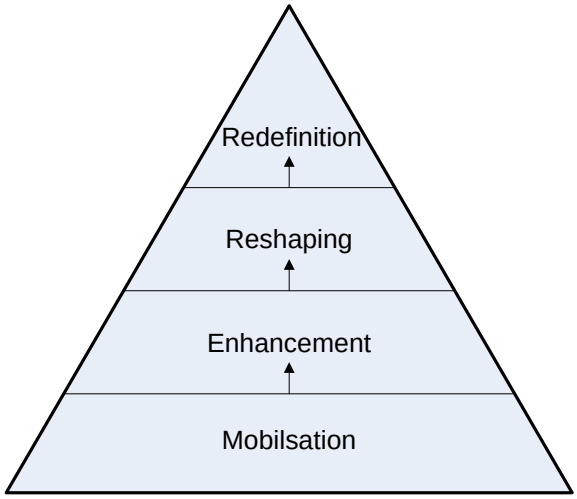

Figure 9: Mobile transformation

6.2.2.4 Conceptual framework

The purpose of these two sets of guidelines, concerning mobile DCs and their constituent practices, is to guide SMEs towards utilising mobile ICT with successful strategic purpose. It is strongly supported by this dissertation, as well as by other authors, that mobility can have a transformational effect on the organisation. The mobile strategy should include the guidelines provided and it should be tautly linked to the business strategy in such a way that it can provide a beneficial influence.

Figure 10, depicts a proposed framework of the combined guidelines. Again, there is no sequential order to either the *mobile dynamic capabilities* or the *practices influencing dynamic capabilities* stipulated in the framework. It is only the *mobile transformation* levels that have a sequential progression (as indicated by the arrows) and consequently, it is depicted in a triangle with the lowest progression at the largest end and the highest progression at the smallest end.

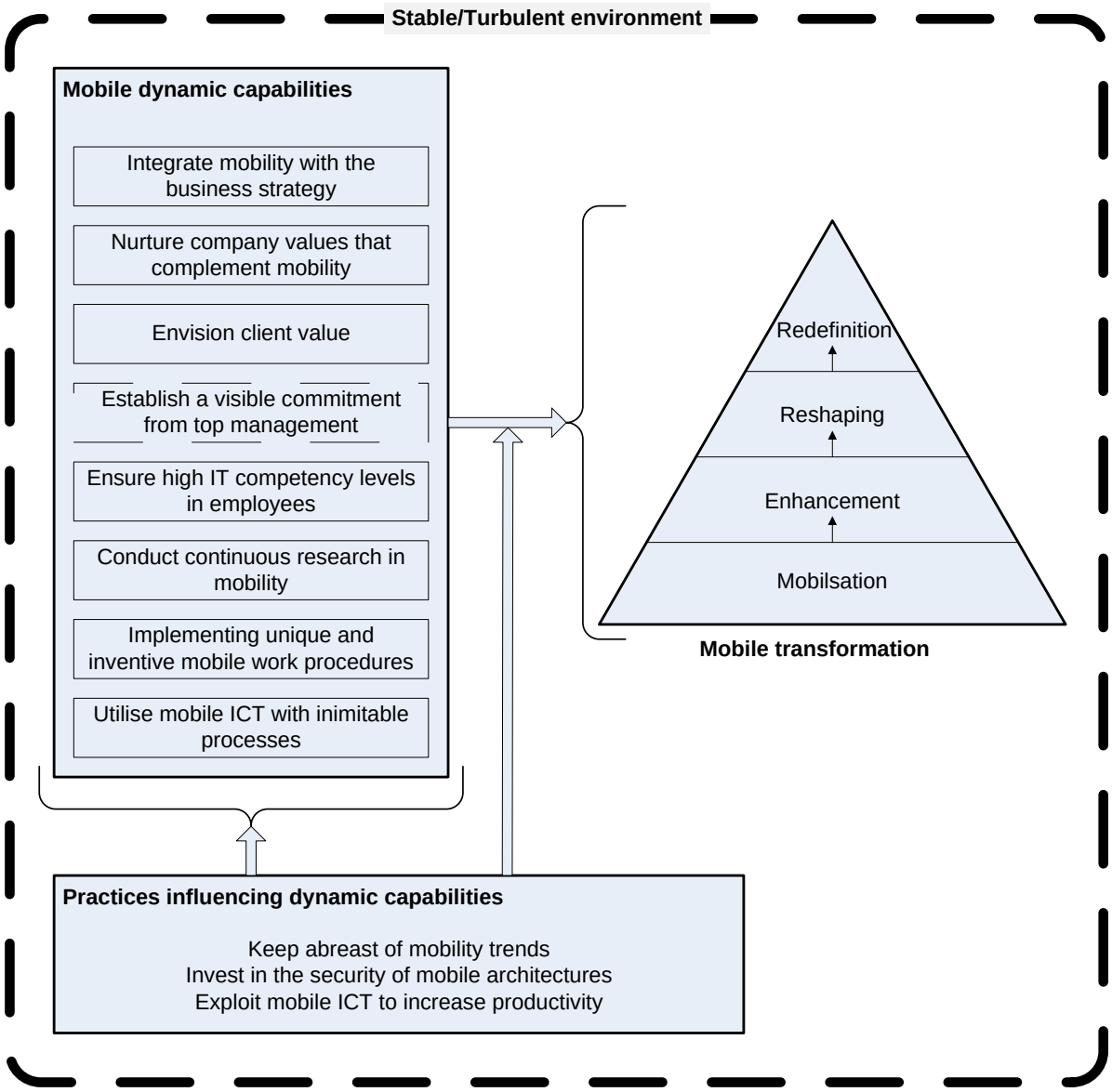

Figure 10: Guidelines for the strategic utilisation of mobile ICT in SMEs

- The patterned border illustrates that the environmental conditions (either stable or turbulent) will exert an influence on how the mobile DCs and the relevant practices are conducted. Consequently, it will also have a major influence on how the company utilises mobile ICT to achieve transformation.
- An arrow connects the mobile DCs box with the mobile transformation triangle. It signifies the positive relationship between the execution of DCs and the achievement of mobile transformation.
- The box indicating the practices that influence DCs is connected with an arrow to the mobile DCs box. This signifies the influential relationship that the practices will have on developing and maintaining the effectiveness of the capabilities.

- These practices will also exert an influence on how successfully transformation is achieved. Consequently, there is an arrow stretching from the box indicating the practices to the arrow connecting mobile DCs with mobile transformation. It signifies the influence that the practices exert on the achievement of transformation. For example, Company G has deployed five of the eight DCs, some of them with significant efficiency. However, they do not practice any methods of securing their mobile architectures, which in turn had a negative influence on how well the capabilities could achieve transformation in their company.

6.3 Concluding summary

This chapter started with relevant evidence to support the findings of chapter 5. The information from the interviews (as discussed in chapter 5), previous research on the theory of DCs, as well as the previous literature reviewed, were used to conduct logical arguments that provide evidence for the outcomes of the study. Guidelines were provided that operationalise all the knowledge derived in the study. Lastly, this chapter combined all the results and the strategic guidelines to achieving mobile transformation into a proposed conceptual framework.

The following chapter will provide answers to the research questions that were posed in chapter 1. The academic contribution of the study, limitations to the study and recommendations for future research will also be discussed. Finally, the study will be concluded.

Chapter 7 – Research summary and conclusion

7.1 Introduction

This research study has investigated the concept of dynamic capabilities (DCs) and how they contribute towards the strategic utilisation of mobile ICT in SMEs. It has identified these capabilities, together with practices that improve their efficiency and presented the results with the development of a conceptual framework that can guide SMEs in their quest to invest in mobility. The previous chapter discussed these guidelines and explained them in a conceptual framework. The final chapter of this dissertation demonstrates how the research questions posed in chapter 1 have been answered. It also provides a summary of the research contribution that was made in the study. A discussion of the problems or limitations in this study is included, as well as recommendations for future research.

7.2 Research questions

This research study proposed a set of research questions, as indicated in the first chapter of this dissertation. The following section will provide answers to those questions, based on the findings of the study.

How do DCs enable the strategic utilisation of mobile ICT in SMEs to effectively contribute to a complete mobile transformation?

The purpose of this study was to understand how SMEs use mobile ICT, from a strategic perspective. The transformation referred to in the question concerns significant modifications to a firm's business strategy, operating procedures and organisational interfaces, either through purposeful or tacit strategic actions. The theory of DCs was used to analyse the utilisation of mobile ICT in SMEs and to determine how mobile transformation is achieved. The theory of DCs instructs firms to acquire, create, improve or dispose of bundles of complementary resources that are effective to contribute to sustained competitive advantage (Teece & Pisano 1994). It is a strategic management theory and it provides a strategic approach to the utilisation of these bundles of resources.

Most of the SMEs interviewed have implemented mobile DCs, through purposeful or tacit strategic actions and have achieved transformations in their business strategy, operating procedures and organisational interfaces. This transformation progressively improves the firm at an enterprise-wide level, according to how effectively and innovatively the mobile DCs are performed. Chapter 5 and 6 discussed the mechanics of how every DC deployed can contribute towards mobile

transformation in the SMEs. The mobile transformations achieved have been divided into four progressive categories: mobilisation, enhancement, reshaping, and redefinition.

How do DCs enable sustained success in the turbulent environment of mobility?

DCs are defined according to four conditions:

- the capability should be valuable,
- the capability should be rare,
- the capability should be inimitable, and
- the capability should be non-substitutionable.

Eight mobile DCs are identified according to the four conditions and they are listed in Table 7, chapter 5. The identification of DCs also provides the insight that in turbulent markets, the survival of firms is less at risk from external sources than from tension within the firm (Eisenhardt & Martin 2000). If the capacity of DCs are harnessed correctly, then they can offer the opportunity to generate variety within the firm by identifying different viewpoints and approaches, rather than a single conventional option (Daniel & Wilson 2003). DCs suggest that the mobile strategies of turbulent environments should be developed with clear vision and a taut coupling with business strategies.

Are there standard established practices that can develop and maintain these capabilities?

Three common practices were observed in the interviews. They are:

- keeping abreast with mobility trends,
- the importance of security, and
- exploiting mobile ICT to increase productivity.

These practices require firms to not merely remain knowledgeable about new innovations in mobility, but to only adopt a technology that will complement and facilitate business objectives. Keeping abreast of mobility trends is an essential factor in assuring that mobile DCs remain up-to-date and competitive. The practices also urge firms to invest resources in the security of all mobile architectures and mobile devices. The SMEs interviewed agreed that mobile security should be a top priority. Mobility has made organisations vulnerable to new harmful activities and any expansion towards mobile transformation should be accompanied with sufficient

protective measures to safeguard corporate assets and data. Finally, mobility provides a diverse assortment of evolving methods for improving productivity. The efficiency of mobile DCs can be developed and maintained when mobile ICT is actively applied to improve productivity.

Why is it significant that such practices can be commonly shared across different companies?

The practices that frequently occurred across the different companies suggest that there are common methods for developing and maintaining the effectiveness of mobile DCs. The frequent occurrence of these practices and the success in mobile transformation, to which they contributed, suggest that they may be referred to as a benchmark approach in mobility development. Therefore, these practices could become a valuable standard in guiding SMEs towards mobile maturity.

7.3 Research contribution

This dissertation provides an alternative source of strategic guidance than what is offered by the analytical, conventional strategic frameworks. The theory of DCs has incited considerable interest in the field of strategic management. It is an insightful discipline that could certainly provide valuable and pragmatic implications for practitioners (Daniel & Wilson 2003). The purpose of the study is to interpret how SMEs use and plan for mobile ICT with strategic intentions. The end product is a conceptual framework that demonstrates guidelines for directing SMEs in the strategic deployment of mobile ICT. This will be valuable for the research of mobile strategy formulation and for the practice of mobility planning in SMEs. Through proper mobile planning procedures, the chances of successful mobile ICT deployments in SMEs will be higher and this will contribute towards strengthened profitability (Ghobakhloo et al. 2012). The researcher agrees with Brown (2002:27) who stated that “it may be appropriate for more theory generating research to be conducted, employing qualitative techniques”. While this research study does not generate a theory, it does heed Brown’s advice to apply qualitative methods to conduct research in strategy. It utilises an exploratory research approach to contribute to and inform future empirical studies of mobility strategy and transformation in SMEs. It can also be informative to the growing body of knowledge on DC research.

7.4 Evaluation of research

Interpretive research can provide rich and meaningful information into the understanding of the social aspects in organisations, but its results are not above reproach. Consequently, Klein and Myers (1999) suggest that researchers should substantiate the validity of interpretive research projects. Atkins and Sampson (2002:102) recommended nine guidelines for evaluating qualitative studies. These guidelines, as listed in Table 10, will be discussed to evaluate the contribution made by the study.

Table 10: Nine guidelines for evaluating qualitative papers (Greenhalgh 1997 in Atkins & Sampson 2002:102)

1	Did the paper describe an important clinical problem addressed via a clearly formulated question?
2	Was a qualitative approach appropriate?
3	How were the setting and the subjects selected?
4	What was the researcher's perspective, and has this been taken into account?
5	What methods did the researcher use for collecting data, and are these described in enough detail?
6	What methods were used to analyse the data, what quality control measures were implemented?
7	Are the results credible, and if so, are the clinically important?
8	What conclusions were drawn, and are they justified by the results?
9	Are the findings of the study transferable to other clinical settings?

1. *Did the paper describe an important clinical problem addressed by a clearly formulated question?*

The research problem is described in chapter 1 and substantiated with various references to previous research. Research questions and objectives are also formulated and discussed to provide a clear understanding of the research problem. This study attempts to address the paucity of research regarding the strategic utilisation of mobile ICT, and the complete lack of relevant research specific to SMEs.

2. *Was a qualitative approach appropriate?*

An exploratory research approach was adopted because so little relevant research exists. A qualitative research method provided the researcher with the opportunity to gain a rich understanding of the context of each individual SME. Semi-structured interviews with candidates from each SME provided more descriptive information. It also provided the researcher with the opportunity to gain a deeper understanding of certain interview questions or to learn information that was not previously anticipated. In the end, qualitative interviews provided comprehensive and appropriate information to an exploratory study.

3. *How were the setting and subjects selected?*

The researcher asked lecturers and practitioners about the possible identification of SMEs that have accomplished, mature or interesting achievements in mobility. The researcher also used the Internet to find information on websites and published material to identify additional companies. All prospective companies were contacted telephonically and knowledgeable interview participants were identified. The participants were contacted and asked how they use mobile ICT. When the inquiries proved that a company practices sufficient mobile procedures and approaches, an interview was scheduled. Eight of the ten interviews were conducted at the offices of the interviewees for their convenience and to ensure their comfort. Two interviews, those with company I and J, were conducted via videoconferencing due to travel restrictions, however, the content received in those two interviews did not seem to be deficient in any way, when compared to the other eight, either in terms of volume or quality.

4. *What was the researcher's perspective, and has this been taken into account?*

The researcher provided his analytical perspective to the data in chapter 5 and 6. In all cases, the researcher attempted to provide an *educated* perspective, based on knowledge acquired from previous literature, the theory of DCs and the firms interviewed. The researcher proposes that the intentional development and maintenance of DCs specific to mobility can greatly improve the strategic influence of the SMEs and positively contribute towards profitability.

5. *What methods did the researcher use for collecting data, and are these described in enough detail?*

Semi-structured interviews were used to collect data. The dramaturgical model, developed by Myers and Newman (2007) was used as a guideline to conduct each interview. Information regarding this model is described in detail in chapter 4, as is information regarding the research protocols, the data collection instruments and information regarding the SMEs and the participants interviewed. As agreed with the interviewees, none of the published information can be used to specifically identify an individual company or participant.

6. *What methods were used to analyse the data, what quality control measures were implemented?*

The qualitative data analysis method of coding was used to analyse the data, according to material provided by Myers (2010) and Schmidt (2004). The procedure followed is summarised into four steps in chapter 4. The theory of DCs and a specific model, adapted from Mata et al. (1995:494), was used to guide the analysis and to provide an interpretation of the results. The specific steps followed in the analysis, as well as the adapted DCs model, can be found in section *4.5.2 Analysis and interpretation of data*.

7. *Are the results credible, and if so, are they clinically important?*

The results are based on findings developed from the responses received during the interviews and substantiated by previous literature. This ensures the credibility of the data. The results can contribute to further academic research about mobility in SMEs and they also provide pragmatic guidelines that can be implemented by SME managers. SMEs often have a deficiency in internal IT skills and consequently, there is a requirement for relevant help and guidance in their IS decision making.

8. *What conclusions were drawn, and are they justified by the results*?

The main conclusion is the development of a conceptual framework to guide SMEs. It also emerged that DCs can provide a viable strategic method for SMEs to utilise mobile ICT in ways that will achieve complete enterprise-wide transformation and contribute towards a competitive advantage.

9. *Are the findings of this study transferable to other clinical settings?*

It is believed that the findings of this study can be used to instruct future research on mobility in SMEs, even if it is only used as a reference model.

7.5 Research recommendations

The guidelines and the conceptual framework developed in the study have been derived from an analysis conducted on companies that have achieved various levels of success in mobility. The framework has not been tested during the study. When these guidelines are deployed in an SME, it is recommended that an empirical study conduct a measurement analysis to calculate the impact. As mentioned, the stable or turbulent conditions can have a commanding impact on the way in which DCs should be conducted and consequently, a firm should take the time to analyse their environment and then adapt the capabilities according to their own requirements. Each organisation will be different and it is recommended that managers apply these results specific to their own environments.

7.6 Discussion of limitations

Although case study research provides a rich understanding of a limited collection of individual organisations, it often lacks in generalisability that large-scale observations can provide. Since the exact context of each organisation will be different, there might be more DCs and more strategic opportunities present in the industry that were not identified in this study. Each organisation will have to apply the theory of DCs in an analysis capacity to determine the baseline capabilities present (or required) before they embark on developing those suggested in this dissertation.

A short-coming in this study is the lack of a reliable measurement scale for determining the exact mobile transformation levels of a firm, mentioned in chapter 2

and 5. In the study, the subjective opinions of the interviewees combined with the researcher's analysis, guided by all the data collected and knowledge gained from previous research, were employed to calculate the transformational level of each SME. A more reliable and repeatable measurement tool is required.

7.7 Suggestions for future research

There are areas identified in the study that can be expanded upon with future research. Following is a list of possible suggestions for future research:

1. As mentioned before, it is required to conduct further investigation into the mobile transformation levels. Future research is required to create a reliable and repeatable measurement tool for determining the exact mobile transformation levels of a firm.
2. This study has focused on SMEs, but academic literature can also benefit from a study that investigates the influence of mobile DCs on the strategic activities and profitability of large organisations.
3. The applicability of the results arrived at in this study can also be extended to a greater sample of organisations to improve generalisability. Additional studies that can refine and extend these findings are welcome.
4. The preliminary nature of this study also meant that it cannot be exhaustive and further studies are necessary to identify additional DCs that provide a strategic influence to the utilisation of mobile ICT.

7.8 Concluding summary

Mobile technologies are constantly progressing and maturing and businesses should prepare for a mobile future (Basole & Rouse 2007). Planning for mobility is an investment, which is strategically important, but it can also have a substantial impact on an organisation's capacity, validity and survival (Ghobakhloo et al. 2012).

Mobile ICT is a commodity technology and not a source of competitive advantage on its own, but it is the way in which it is used in business that can lead to a transformation and an increase in productivity (Basole 2005b; Scornavacca & Barnes 2008). As mentioned in this chapter, DC is a theory which is most suited to discovering how IT assets become capabilities through the way which they are utilised and managed. Other than larger organisations, SMEs also tend to be informal, tacit and dynamic in its strategic behaviour and in the execution of strategic activities (Blili & Raymond 1993; Dyerson et al. 2009; Ghobakhloo et al. 2012). However, "behind every successful company there exists a strategy that works regardless of the way it has been developed, through formal analysis, trial and error, intuition or pure luck," and DC has the ability to shed light on these strategic activities

(Madan et al. 2003:[4]). “Dynamic capabilities rest upon many organisational routines, which are tacit and often difficult to replicate” (Chen et al. 2008:368).

Owing to the paucity of previous research of DCs in the mobility domain, this study adopted an explorative approach to investigate the strategic influence that mobility will exercise on an SME. The concept of DCs attempts to quantify the mechanisms of exactly how key resources benefit the firm (Wade & Hulland 2004). It proposes a process-oriented approach to: a) perform the role of a buffer between resources and fluctuating business environments, and b) assist the firm in adjusting its strategic resource bundles. This will contribute towards a temporary competitive advantage, which might have quickly eroded under different circumstances (Eisenhardt & Martin 2000; Teece et al. 2007; Wade & Hulland 2004). IS resources exhibit attributes that are relatable to DCs, and consequently, they integrate smoothly with the DC framework and they may be specifically useful to companies operating in rapidly fluctuating environments (Jarvenpaa & Leidner 1998). Similar to DCs, IS resources also do not directly lead to sustained competitive advantage. However, they are essential to the company’s long-term competitiveness in volatile environments. The theory of DCs provides a fresh perspective for the renewed relevance of IS resources (Wade & Hulland 2004).

Dynamic capabilities are a strategic prerogative for achieving competitive advantage and consequently, they provide an important understanding into the strategic use of mobile ICT. The purpose of this study was to analyse existing SMEs in different industries, and to identify the presence of mobile DCs. Mobile DCs are strategic resources that stipulate certain ways of utilising mobile ICT to positively contribute towards an enterprise-wide transformation and positive competitive advantages. The study also identifies practices that are frequently conducted by firms to develop and maintain the effectiveness of DCs. The results of this study were identified according to guidelines that direct SMEs towards the strategic utilisation of mobile ICT to achieve a significant transformation. A conceptual framework was developed to illustrate the results.

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Annexure A – Interview introduction and questions

Towards an understanding of the strategic use of mobile ICT in small and medium enterprises

Thank you for participating in my research and I trust that together we will be able to identify what the significance strategic influence of mobile ICT is within your business and how you can better utilize the organizational capabilities to ensure that your business grows to even more new frontiers. Below is a brief introduction as to the aim of this research paper is and what the desired outcome thereof will be. After the findings have been analyzed, you as a participant will also receive a summary of the findings which you can then use as guidelines for your own business.

Mobile Information and communication technology (ICT) has the capability to completely transform businesses, products, processes and industries (Basole 2005b). Mobile ICT, which include devices and wireless networks capable of supporting computing power on the move, has initiated the next IT renaissance (Basole 2007; Sheng et al. 2005). Mobile ICT includes "technological infrastructure for connectivity such as Wireless Application Protocol (WAP), Bluetooth, 3G, and General Packet Radio Service (GPRS) as well as mobile information appliances such as mobile phones, PDA, [tablets], and laptop computers" (Sheng et al. 2005:269-270). There are well established reasons why mobile ICT is an attractive delight for small businesses. It will make information access available 'anytime, anywhere' and provide improved collaboration and communication as well as new bounds for information sharing (Basole 2004; Sorensen 2004).

The strategic value of mobile ICT and its potential impact on business competitiveness makes it an interesting topic for research. The technological characteristics of mobile ICT products are a common concern shared by SME managers (Ghobakhloo et al. 2012). A comprehensive mobility strategy is critical for SMEs. It will manage security concerns, evade incompatible technologies, carefully allocate scarce financial resources, and it will stabilise the influence on people, technologies and processes. It will enable the small business to carefully take advantage of the technological evolutions in mobile technologies (Passerini et al. 2007).

This paper seeks to assist SME managers undertaking mobile transformation by investigating the role of dynamic capabilities in this domain. The term mobile transformation refers to the organisation's deployment of mobile ICT to significantly modify its business strategy. In keeping with the resource based view, strategy is defined as a "pattern in a stream of decisions" (Mintzberg 1978:935). This paper applies the theory of dynamic capabilities to analyse the specific capabilities that are required for mobile transformation and identifies practices necessary in developing

the dynamic capabilities that are both effective and shared across industries, and accordingly can be referred to as being 'best practice'.

Below are the interview questions:

Interview Questions

Interviewee: _____ Company: _____

Position: _____

Date: _____ Time: _____ Duration: _____

A mobile enterprise is not simply deploying laptops to enable employees to work at home. Experts have determined that laptops provide such little true mobility that it is rather identified as a geographic extension of the existing static enterprise. Similarly, an enterprise does not become mobile be simply handing out smart phones, tablet PCs and other handheld devices. Many organisations claim to have such a workforce, yet, it does not make a difference to the way those employees interact with each other or with the rest of the organisation (Basole & Rouse 2007).

1. Identification of SME, industry sector, background information
    a. Type of SME
    b. Industry sector
    c. Background
    d. Number of years in operation
    e. How long have you been using mobile ICT?
    f. Number of employees
    g. Number of employees working with mobile ICT?
2. What are the general professions of the employees? What are their skills levels (professional and IT related)?
3. What types of mobile technologies do you use in your organisation?

Technology / Company	A	B	C	D	E	F	G	H	I	J
Mobile Phones										
Mobile internet										
Mobile email										
Mobile calendar										
Mobile website										
Instant Messaging										
Wireless networks										
Laptops										
PDAs										
Tablets										
Anytime anywhere services										

(including location awareness)										
Cloud computing										
RFID (radio frequency identification) tagging										
Mobile Applications (Employees or Customers or Suppliers										
Bring your own device service policy										
Other										

4. Has the use of mobility had any of the following impacts in your company?

Types of benefits (Basole 2007)	Details	Y/N
Strategic Benefits	Greater customer satisfaction; enterprise visibility into assets and resources; higher return on investment; enterprise process visibility (Basole, 2007; Frost & Sullivan Whitepaper, 2007; Zetie, 2005).	
Informational Benefits	Rapid decision making due to the accessibility of information and resources; immediate access to required information (Basole, 2007; Sorensen, 2004).	
Transactonal Benefits	Cost reduction (specifically in communication); improved productivity regardless of location; improved time management; trusted accuracy; real-time data transmission (Basole, 2005; Frost & Sullivan Whitepaper, 2007; Sorensen, 2004).	
Enterprise Transformation	The fading of organisational boundaries; healthier teamwork; corporate control; a horizontal organisational culture (Basole, 2005; Frost & Sullivan Whitepaper, 2007; Sorensen, 2004).	
Business Value of ICT	Mobile ICT efficacy, effectiveness and convenience in the enterprises (Basole, 2004; Basole, 2005).	

5. Would you describe your company as being mobile?
    a. This is more than simply using mobile technologies. This refers to a transformation in the business practices and processes to maximize the benefits provided my mobile ICT.
    b. Has there been an attempt to reevaluate and reorient conventional activities and procedures to adopt mobile work practices or to gain leverage from its advantages?
    c. Has mobility provided an increase in teamwork across conventional organizational boundaries?
6. Do you provide any IT training in your organisation?
    a. Are personnel well trained on new and existing technologies?

   b. Is IT training a visible priority to the company?
7. How do you primarily communicate and collaborate with your employees?
   a. How important is mobile technologies for the purposes of communication?
   b. Has mobility contributed to the openness of communication "across business units, chains of command and functional boundaries" (Powell & Dent-Micallef, 1997:384).
8. How do you primarily communicate and collaborate with your customers and suppliers?
   a. How important is mobile technologies for the purposes of communication with customers and suppliers?
   b. Have any of these activities incited convenient partnerships with your suppliers or customers?
9. Have you made any efforts to integrate mobile planning with the overall goals, strategies or strategic planning procedures of the business?
   a. What is your vision of regarding how mobility contributes to business value?
10. What are top management's perspectives and attitudes towards mobile ICT?
   a. What is the motivation levels of management toward IT/IS investments?
   b. What influence does top management have on the success of mobile ICT deployments?
11. Do you use any mobile technologies for marketing?

Building relationships

12. Where do you get advice and support with regard to IT issues and management?
   a. Do you outsource support, if yes, why or why not?
   b. Have you configured new alliances with diverse stakeholders to support your company with mobile technology development?

13. Do you deploy standard packaged mobile solutions or do you tailor solutions to suite your specific business requirements?
14. Do you have a procedure by which you research or investigate new mobile technologies, and if you do, what is it?

The external environment

15. Who are your biggest competitors?
   a. How strong of a threat are they to you?
   b. Has mobility provided you with any mentionable advantages over them (competitive/strategic or otherwise)?

16. Are there any mobile work procedures which have ensured success (positive progression/performance advantage) in your industry?
17. What is the likelihood of competitors copying or replicating any advantage which you have achieved with mobility?

The internal social system

18. Comment on the influence that your organisational culture has on the success of mobility?
    a. For example: 'A culture that embraces and encourages change and experimentation, minimizes fear of failure and welcomes opportunities to apply new IT developments' are generally very successful in IS.
    b. Or "a culture of trusting and open relationships with minimal formalization and bureaucracy" can also be a beneficial capability of mobility (Powell & Dent-Micallef, 1997:384).

The organisation's technology

19. Can mobility change your products/ product lifecycles/ product economics?
    a. What is the scale of influence which mobility has on the enterprise itself?

With particular reference to company-based mobile deployments

20. How do you deal with the dynamic nature of the mobile environment?
21. Do you have any other innovative approaches towards mobility?

Mobile management

22. How highly do you value data security and what efforts have you made to keep your mobile data secure?
23. Do you have any particular methods for managing mobile employees? Any consistent policies?

Employees and other tangible assets

24. Comment on the maturity of mobility in your company

25. What, specific to mobility, keeps you awake at night?

Annexure B – Introduction, permission, informed consent letter

This annexure displays the template in which the introduction letter, permission letter and the informed consent letter are combined into one letter which was provided to all participants for their signature before every interview.

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Faculty of Economic and Management Sciences

Letter of Introduction and Informed Consent

Dept. of Informatics

Title of the study

Towards an understanding of the strategic use of mobile ICT in small and medium enterprises

Research conducted by:
MR MD Maree (24042422)
Mobile Number: 082 338 4966

Dear Participant

You are invited to participate in an academic research study conducted by Michiel Maree, Masters student from the Department Informatics at the University of Pretoria.

The purpose of the study is to provide guidelines to assist small and medium enterprise (SME) managers undertaking mobile transformation. The term mobile transformation refers to the organisation's deployment of mobile information and communication technology (ICT) to significantly modify its business strategy. The paper analyses mobile ICT usage in SMEs by investigating the role that dynamic capabilities play in the achievement of mobile transformation.

Please note the following:

This is an anonymous interview and neither your name nor your company's name will appear anywhere in the paper. The answers you give will be treated as strictly confidential as you cannot be identified in person based on the answers you give.

- Your participation in this study is very important to us. You may, however, choose not to participate and you may also stop participating at any time without any negative consequences.
- Please answer the questions during the interview as completely and honestly as possible. This should not take more than 45 minutes of your time.
- The results of the study will be used for academic purposes only and may be published in an academic journal. We will provide you with a summary of our findings on request.
- Please contact my study leader, Prof I. Strydom (Mobile Number: 082 550 0983 or email: ian.strydom@up.ac.za), if you have any questions or comments regarding the study.

Please sign the form to indicate that:

- You have read and understand the information provided above.
- You give your consent to participate in the study on a voluntary basis.

_____ _____

Participant's signature **Date**

Annexure C – Ethical permission

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FACULTY OF ECONOMIC AND MANAGEMENT SCIENCES

RESEARCH ETHICS COMMITTEE

Tel: +27 12 420 4102
E-mail: berendien.lubbe@up.ac.za

27 June 2013

Strictly confidential

Prof I Strydom
Department of Informatics

Dear Professor Strydom

Project:	***Towards an understanding of the strategic use of mobile ICT in Small and Medium Enterprises***
Researcher:	**Maree, MD**
Student No:	**24042422**
Supervisor:	**Prof I Strydom**
Co-supervisor:	**Dr M Matthee**
Department:	**Department of Informatics**

Thank you for the application you submitted to the Committee for Research Ethics, Faculty of Economic and Management Sciences.

I have pleasure in informing you that the Committee formally approved the above study on 26 June 2013. The approval is subject to the candidate abiding by the principles and parameters set out in the application and research proposal in the actual execution of the research.

The approval does not imply that the researcher, student or lecturer is relieved of any accountability in terms of the Codes of Research Ethics of the University of Pretoria if action is taken beyond the approved proposal.

The Committee requests that you convey this approval to the researcher.

We wish you success with the project.

Sincerely

PROF BA LUBBE
CHAIR: COMMITTEE FOR RESEARCH ETHICS

cc: Dr M Matthee
Prof AJ van der Merwe